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WEED ABSTRACTS

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NOTES FOR READERS

Weed Abstracts endeavours to provide a comprehensive coverage of the world's literature on weeds, weed control and closely allied subjects. To this end, over 370 journals and nearly 100 annual reports are regularly searched. Other journals, reports, bulletins, etc. are abstracted as they are seen. Additional coverage is obtained through agreements with other abstracting organisations.

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As far as possible the journal abbreviations used are those given in the World List of Scientific Periodicals. Holding libraries in Oxford and elsewhere are also taken from the World List, e.g. O.BO. = Botany Department, Oxford. Numbers at the end of abstracts e.g. 75(492) are for internal use only.

When a paper is by more than one author, the address of the first author only is given.

Where an abstract is taken from an abstracting journal the acknowledgement follows the abstract, e.g. Herb.Abstr., 2,163. Where it is quoted only in part the acknowledgement is preceded by the word "from", e.g. From Biol.Abstr., 2,294.

The Information Section is always pleased to receive comments and suggestions for the improvement of Weed Abstracts.

* An asterisk before the author's name indicates that only the title of the paper has been seen.

Continued from the inside back cover.

ac	- acre(s)	in.	- inch(es)	p.s.i.	- pounds per square inch
a.e.	- acid equivalent	kg	- kilogram(s)	v/v	- volume/volume
a.i.	- active ingredient	l	- litre(s)	w/v	- weight/volume
cm	- centimetre(s)	lb	- pound(s)	w/w	- weight/weight
d.b.h.	- diameter at breast height	m	- metre(s)	>	- greater than
ft	- foot(feet)	ml	- millilitre(s)	<	- less than
g	- gram(s)	oz	- ounce(s)	#	- pounds per acre
gal	- gallon(s)	post-em.	- post-emergence	±	- with or without
ha	- hectare(s)	pre-em.	- pre-emergence		
		p.p.m.	- parts per million		

Language abbreviations: an initial capital denotes the language of the article, a small letter that of the summary:- Dan.- Danish, Du. - Dutch, E. - English, F. - French, G. - German, It. - Italian, Jap. - Japanese, Nor. - Norwegian, Russ. - Russian, Span. - Spanish, Sw. - Swedish.

See also 520,539,548.

430. FRIESEN, G., SHEBESKI, L.H. and ROBINSON, A.D. (Univ.Manitoba,Winnipeg, Canada). Economic losses caused by weed competition in Manitoba grain fields. II. Effect of weed competition on the protein content of cereal crops. Canad.J.Plant Sci., 1960, 40,(4),652-8, tabs.2,bibl.11.

Economic losses caused by weed competition in Manitoba grain crops were studied on 142 farm fields during a 3-year period from 1956-58. Ten paired plots were located in each field and half of each paired plot was kept weed-free throughout the growing season by hand-weeding at weekly intervals. Determinations were made of the protein content of the grain harvested from 22 wheat and 12 barley fields in 1957, and from 11 wheat, 9 barley and 6 oat fields in 1958. Significant increases in grain protein content were obtained following weed removal in 15 out of 34 fields in 1957, and in 8 out of 26 fields in 1958. Significant increases in yield were obtained on 23 fields studied in 1957, and on 10 in 1958. In a combined analysis of all fields removal of weeds resulted in significant increases ($P = <0.01$) in both protein content and yield of wheat, barley and oats. - J.W.F. [245(71)]

431. RADEMACHER, B. (Inst.für Pflanzenschutz,Stuttgart-Hohenheim,Germany). Traditionelle und moderne Verfahren in der Unkrautbekämpfung. [Traditional and modern procedures in weed control.] Schweiz.landw. Monatsh., 1960, 38,159-188, figs.11,tabs.4, bibl.32.

A critical and detailed study and comparison is made of traditional and modern methods of weed control. It is emphasised that neither is effective alone. The greater part of the paper is devoted to results of experiments designed to investigate traditional methods of weed control, and how their use has changed the weed flora of both arable and grassland in the last century. There was evidence that harrowing could be regarded as a selective method of weed control, that the chain harrow is superior to the zig-zag spike harrow, that it works principally by burying weeds rather than by uprooting them, and that 4 m.p.h. is the optimum speed, with penetration to a depth of <1.5 in.

The above work has suggested strongly that the rotational use of cleaning crops is still an essential for both weed control and maintaining the soil in a desirable condition. The direct effects of mechanisation through consolidation of the soil and the use of combines was also studied. - P.C. [251(43)]

432. BACHTHALER, G. (Höhere Landbauschule, Rotthalmünster,Bavaria). Dreijährige Feldversuche zur Frage der chemischen Bekämpfung des Wildhafers (Avena fatua L.) in Sommergetriede. [Three-year field trials on chemical control of wild oats (Avena fatua) in spring cereals.] Z.Acker.Pflanzenbau., 1960, 112, (1), 55-74, (G.e.), tabs.7,bibl.31.

In experiments in 1957-9 on the control of wild oats (Avena fatua), 14 trials were carried out in barley and 1 in oats in which CDAA and CDEC 50% a.i. were applied at from 15 to 600 l/ha 10 days pre-sowing. In all trials the reduction in wild oat population ranged from 10-89% where spraying was followed by harrowing. Where there was an interval of 10 days between treatment and sowing stands of barley were reduced by 8 to 30% in 8 out of 14 trials, while the remainder showed an increase of 13.5 to 78%. Oats also showed reductions in stand ranging from 8.5 to 30%.

CDEC was more effective against wild oats than CDAA and caused less injury to the spring cereal. Soil type and pH value did not appear to affect the toxicity of either herbicide; but other variables caused such inconsistent results that no firm recommendations for the use of these herbicides could be made. -P.C. [O.W.]

433. EVANS, S.A. (Weed Res.Org.,Begbroke Hill,Kidlington,Oxford,England). Wild oats are on the way out. Farm & Stkbreed., 1961, 75,(3712),107-9, figs.3.

Avadex [2,3-dichloroallyl diisopropylthiolcarbamate] should be applied at 1.5 # in 20-30 gal water; a good tilth must be present, and the herbicide incorporated to a depth of 2-4 in. by harrowing or discing. Treatment should be confined to the following varieties of barley: Proctor, Freja, Herta, Maythorpe and Earl. Spring wheat should not be treated. A control of Avena fatua of 80% should follow. Barban should be applied at 0.35 # in 10-20 gal water and the land must be in a state of high fertility to ensure that the crop competes well with A. fatua. It is essential that spraying be carried out when A. fatua is at the 1-2.5 leaf stage; earlier treatment is less successful, and later treatment may result in damage to the barley. Spring wheat may be sprayed with barban, but not spring barley. Winter wheat when treated after spring growth has started is checked, but no reduction yields have been observed. The interval between the emergence of A. fatua and commencement of spring growth of wheat may be very short, and spraying must be carried out during this interval. - P.C. [O.W.]

434. EDDOWES, M. (Harper Adams Agric. Coll., Newport, Shropshire, England). The control of weeds in maize. Tech. Bull. Harper Adams agric. Coll. 1960, (4), pp. 14.

In trials during 1960, maize was treated (a) pre-em. with 1, 2 or 3 lb of 50% wettable powder formulations of simazine and atrazine in 20 gal spray on 8th May, 5 days after sowing, (b) with 3 lb wettable powder containing 50% simazine pre-em., followed by harrowing immediately after application, (c) with 3 lb wettable powder containing 50% atrazine post-em. to maize in the 4-leaf stage, (d) with 2,4-D amine at 16 oz a.e./ac and MCPA at 16 oz a.e. both in 20 gal water post-em. at the 4-leaf stage. About 1.5 in. rainfall fell during the week after the pre-em. treatments. Both simazine and atrazine pre-em. gave excellent control of annual weeds at all rates used, though atrazine was slightly better than simazine. Dominant weeds were: Chenopodium album, Poa annua and Stellaria media. Perennial weeds, including Cirsium arvense, Rumex spp. and Agropyron repens, were little affected by the treatments. Harrowing after applying simazine reduced its effectiveness. Assessment of weed control on 27th June showed that simazine and atrazine were still highly effective, with atrazine slightly the better. Convolvulus arvensis, Polygonum aviculare and Vicia hirsuta showed some resistance. Atrazine applied post-em. was ineffective. 2,4-D and MCPA gave adequate control of most weeds and controlled C. arvense and Rumex spp., though 2,4-D was more effective. Compared with where 2,4-D or MCPA was used, simazine resulted in higher yields more tillers but fewer and lighter ears. Yields where simazine and atrazine were used were highly significantly greater than on unsprayed areas. It was suggested that simazine may have stimulated the vegetative, as opposed to the reproductive growth, of maize. See also Weed Abstr., 9, 229. - P.J.B. [432(42)]

435. MIETO, J.H. (Oficina de Estudios Especiales, S.A.G., Mexico). Elimine las hierbas a tiempo. [Eliminate weeds in time.] Agric. tec. Mexico, 1959-60, 9, 16-19, (Span.), figs. 1, tabs. 1.

A 3-year trial in the wet tropical Vera Cruz region in which the yields of hybrid maize were compared after keeping the maize (1) weeded and (2) unweeded for 15, 25, 35 and 45 days after sowing, showed the importance of keeping the maize weed-free during the first 35 days after sowing and indicated the value of herbicidal treatment. Weed growth was most prejudicial in the period from 25th-35th day after sowing. - D.M.L.S. [Md.H.]

436. PHILLIPS, W.M. (Kansas Agric. Exp. Sta., Manhattan, U.S.A.) Controlling weeds in sorghums. Circ. Kansas agric. Exp. Sta., 1960, 360, pp. 12, figs. 6, tabs. 1.

Grain sorghum does not compete with perennial weeds as well as do forage types, and cultivations may damage the crop roots. Of chemical measures, 2,4-D alone is successful, but severe damage may result if application is made when plants are <3 in. high; or after the seed-head has begun to form at about 12 in. high. Recommended rates are: 2,4-D ester 0.25 lb, or amine salt 0.4 lb in 8 gal water. - P.C. [20(78.1)]

437. POONAI, P. Weed control in rice fields. Rice Review (Brit. Guiana), 1960, 2, (3), 23-8; Farmers' Leafl. Brit. Guiana Dep. Agric., 12, pp. 5, figs. 7.

Some of the worst ricefield weeds in British Guiana are classified and listed as follows:- (1) Aquatic - Azolla caroliniana, Salvinia auriculata, Marsilia polycarpa*, and Lophotocarpus guyancusis*; (2) Marshland - Hymenachne amplexicaule, Leersia hexandra, Luziola spruceana, Paspalum distichum, Cyperus articulatus, Eleocharis mutata*, E. caribbea*, Rhynchospora aureus, and Fimbrystilis miliacea*; (3) Amphibious - Sphenoclea zeylanica*, Sesbania sericea*, Aeschynomene sensitiva*, Jussiaea erecta* and Thallia geniculata*; (4) Mosses - Spyrogyra.

Those marked with an asterisk can be controlled by 2,4-D after draining, but it should not be applied till rice is at least 5 weeks old or too near flowering. - D.M.L.S. [2(88)]

438. CHIAPPARINI, L. and CORBETTA, G. Nuovi dati sperimentali sul diserbo chimico della risaia. [New experimental data on chemical weed control in rice.] Riso, 1960, 9, (4), 10-12, (It.), figs. 4, bibl. 2.

Mecoprop as Iso-Cornox at 3-7 l/ha (32% a.e. on wt/vol basis) has been found to be selective in rice vars. Americano 1600, Arborio, Balilla, Balilla g.g., Precoce Rossi, S. 136, Gigante Vercelli, R.B. and Roncarolo provided it is applied before tillering at the 5-6 true leaf stage in direct sown rice, or between completion of tillering and before the boot stage in direct sown or transplanted rice. Where possible, pre-tillering application is advisable. The higher rates cause temporary chlorosis in most varieties, but do not adversely affect yields. The early variety Precoce Rossi should be sprayed in the 4-5 true leaf stage and before tillering begins;

rates not higher than 4 l/ha (commercial product) cause slight temporary injury to the roots, but do not reduce yield. A volume rate of 350-450 l/ha is advised. Areas to be sprayed should never be dry. The water level should be lowered enough to uncover the tops of the weeds before spraying and raised to the maximum 24 hours after spraying. Injury to roots is greater with muddy than with clean irrigation water. 5-6 l/ha (commercial product) gives good control of Scirpus maritimus in active growth or in flower, and of Heleocharis ovata; 7 l/ha is ineffective against Buotomus umbellatus when in flower and against Panicum [Echinochloa] crus galli; 3-4 l/ha controls S. mucronatus and Alisma plantago when young. - D.M.L.S.

[70(45)]

439. PATTERSON, T.M. (Ruruhia SoilRes. Sta., Hamilton, New Zealand). Weed control in peas and maize. Proc. 13th N.Z. Weed Control Conf., 1960, 76-81, tabs.4, bibl.1.

Monochloracetic acid (MCA) 10, 15 and 20 #, MCPB 1 # and dinoseb 1.1 # (phenol equiv.) were applied in early spring to peas at the 6- to 7-node stage and in early summer at the 4- to 5-node stage. All treatments, except MCPB, gave good control of Chenopodium pumilio, Polygonum persicaria and Coronopus didymus and all, including MCPB, controlled Amaranthus retroflexus. Rates of MCA greater than 15 # appeared to injure the crop, while 10 # was not fully effective against heavy infestations. In a second trial, peas were treated with MCA 15 # at the 4, 6 and 8-9 node stages. There were no significant differences between yields for any treatment, though the crop appeared to be most sensitive at the 4- and 6-node stages. There were indications that under conditions of heavy weed infestation, MCA would give best control of weeds if applied earlier than at the 8-9 node stage. In a third trial, peas were treated at the 5-node stage with MCA 15 #, MCA 7.5 or 10 # + MCPB at 0.75 or 0.5 #, and MCPB 1 #. Weed infestation was light and consisted mainly of P. persicaria, C. pumilio, C. didymus and Chenopodium album. Best weed control was given by MCA 10 # + MCPB 0.75 #, which controlled all species effectively. Yields of peas did not differ signigicantly between treatments.

In trials with maize during the 1958-9 season, chlorpropham 4 # and simazine 1, 2, and 4 # were applied pre-em. in 36 gal water; and in the 1959-60 season, simazine 4 #, simazine 2 # + trietazine 2 # and trietazine 4 # were applied pre-em., and 2,4-D amine 0.75 # and MCA 20 # post-em. when the maize had 4-5 leaves. The main weeds were A. retroflexus, P. persicaria and Spergula arvensis. In the 1958-9 trials, grain yields varied inversely with the amount of A. retroflexus present. Simazine 4 # gave excellent weed control and increased yields by 70% compared with unweeded controls (61 and 107 bushels/ac respectively). In the 1959-60 trials, yields on all plots treated with triazine herbicides were as high as, or only slightly lower than those on hand-weeded plots and yields with 2,4-D amine were equally high, though weed control was less efficient; MCA gave inferior weed control, though initial kill of weeds was good. At equal rates, trietazine was inferior to simazine in controlling weeds. - P.J.B. [O.W.]

440. HAY, J.R. (Plant Res.Inst., Res.Branch, Canada Dep.Agric., Ottawa, Canada). Pre-emergence weed control in soybeans with mixtures of two herbicides. Weeds, 1961, 9, (1), 117-23, tabs.5, bibl.9.

In trials during 1958 and '59 at Ottawa on soils ranging in texture from loam to sandy-clay loam, soybeans grown in rows 7 in. apart and sown in the latter half of May were treated with the following 2-3 days before soybean emergence: CDAA 4 # + dinoseb 4 #, chlorpropham 4 and 8 #, CDAA 4 and 8 #, NPA 4 and 8 # and dinoseb 4 #. Weed control was significantly better on plots treated with CDAA + dinoseb than on any others. Soybean yields where CDAA + dinoseb were used were significantly better than with any other treatment at 4 #, but not at 8 #. Slight transitory injury resulted from using CDAA. There were no significant differences in soybean yields or weed control where CDAA + dinoseb in different proportions were used. Rates of 2-3 # of each appeared to be close to the minimum required for effective control of weeds and rates of 3-4 # of each were optimum. Some varieties appeared more susceptible than others to distortion of the plumular leaves, but none were premanently injured. Applying CDAA + dinoseb at sowing or immediately before emergence did not influence herbicidal effectiveness, though it was expected that with volatile herbicides such as dinoseb, results in hot conditions ($>90^{\circ}F$) would be best where they were applied just before crop emergence. In trials with different row widths, soybeans were sown in rows spaced 7, 24 and 36 in. apart, with spacings between seeds of 1, 2 and 3 in. respectively. CDAA + dinoseb (each at 3 #) was applied overall on plots with rows 7 in. apart, and in bands

12 in. wide over the rows spaced 24 and 36 in. apart. Weed control and yield increases were excellent on treated plots. Differences between soybean yields were little affected by row width, but from the standpoint of weed control and economy of herbicide, the 36 in. spacing was best. Weeds controlled well in these trials were: Setaria viridis, Echinochloa crus galli, Chenopodium album, Amaranthus retroflexus, Ambrosia artemisiifolia, Portulaca oleracea, Thlaspi arvense and Polygonum convolvulus. -P.J.B. [O.W.]

441. GREAT BRITAIN, NORFOLK AGRICULTURAL STATION. Farm Guide 1960. Norfolk agric.Sta., 1960, p.1, tabs.1.

Propham and endothal at 4.5 and 6 ℔, propham 3 + endothal 3 ℔; and propham 4.5 ℔ + endothal 6 ℔, were applied pre-em. to sugar beet, and compared with mechanical weeding. The latter gave the best results, in terms both of plant vigour and sugar yields. The higher rates of herbicide caused marked crop damage. - P.C. [O.W.]

442. NETHERLANDS, INSTITUUT VOOR RATIONELE SUIKERPRODUKTIE, BERGEN-OP-ZOOM. Rapport van de Commissie ter Bevordering der Suikerbietenteelt in de Noordelijke Provincien over 1959. [Report of the Commission for the Promotion of Sugar Beet Cultivation in the Northern Provinces for 1959.] Meded.Inst.Rat. Suikerprod., 1960, 30,(1), (Du.)

Control of wild oats. In trials in 1959 on heavy clay soil sugar beet sown on 4th April was treated with the following in 1000 l spray: (a) dalapon 12 kg/ha 10-14 days before sowing, (b) as (a) but 15 kg dalapon, (c) TCA 12 kg 10-14 days before sowing, (d) dalapon 12 kg between sowing and emergence, (e) dalapon 12 kg between emergence and singling. Best control of wild oats (1 per m^2, compared with 17 per m^2 for controls on 8th May) and highest yields were given by (b), followed by (a). The wild oats were germinating at the time the pre-sowing treatments were applied. Treatment (e) caused crop injury. Sugar yields for untreated controls were 12.6 kg/are, compared with 75.5 kg for (b) and 56.6 kg for (e). In a second similar trial, dalapon 12 kg applied 10 days before sowing and when the wild oats were about 5 cm high again gave best control, but delayed the growth of the sugar beet to some extent. In other trials on fen soil, HS 55 (N-cyclooctyl-N,N-dimethyl urea + butinol N-(3-chlorophenyl)carbamate) at 4 l/ha in 800 l water applied 5 days after sowing sugar beet gave very poor weed control, whereas in a similar trial on sandy soil, weed control was very good. This difference was attributed to differences in soil. In the trial on sandy soil, sugar beet growth appeared to be delayed to some extent. It was concluded that more trial results would be required before HS 55 could be recommended in practice. - P.J.B. [209(492)]

443. McCUBBIN, E.N. (Potato Investigations Lab., Hastings, Florida, U.S.A.) Chemical control of weeds in potato crops. Proc. Fla State hort.Soc., 1959, 72, 194-7.

In preliminary tests, dinoseb was applied to potatoes at 3 lb a.i./ac before germination of weeds, and in another series of tests just after weed emergence. Dinoseb gave excellent control of Ambrosia artemisiifolia, Amaranthus retroflexus, Asclepias syriaca, Stellaria media and Polygonum persicaria, but did not control Cyperus rotundus and Digitaria sanguinalis. In subsequent tests CDEC 4 ℔ and PCP 4 ℔ also gave 40-80% weed control. In all plots control was best when herbicidal treatments were delayed for as long as possible after sowing, but before the potato plants appeared above ground. Dinoseb and PCP were effective after emergence of weed seedlings, CDEC only before weed germination. The herbicides gave best control when applied to moist surfaces; it follows that such conditions should, in the absence of rain, be created by sprinkler irrigation after application of herbicides. - P.C. [42(75.9)]

444. PRASAD, L.K., SINHA, C.P. and MUKHERJEE, S.K. (Ranchi Agric.Coll. & Res. Inst., Ranchi, India). Preliminary studies on weed control in Rabi potato grown in river sand by Crag herbicide I. Sci. & Cult., 1960, 25,(12),688-90, tabs.2, bibl.2.

In preliminary experiments on sandy soil with 2 potato varieties, D.R.R. and Phulwa, 2,4-DES was applied pre-em. (4 days after planting) at 2.5 and 5 ℔ and post-em. (after 1st earthing-up). The dominant weed was Coronopus didymus. 2,4-DES gave significant reductions in weed stands. The higher pre-em. dose resulted in slightly better control than 2.5 ℔, but a slightly lower mean crop yield (500 g compared with 614 g). There was little difference between the 2.5 and 5 ℔ post-em. applications in terms of both weed control and crop yield (531.87 g and 552.39 g respectively), although the higher rate reduced the leaf size of the crop.

The following season (1957-58) pre-em. applications were made at 0.62, 1.25, 1.87, and 2.5 ℔, using only the variety D.R.R.

The results indicated that 0.62 # controlled the principal weeds up to the time of harvest although the higher rates gave better initial control. No significant differences were observed in tuber yield. - J.W.F.
[G.R.I.]

445. FOREMAN, M.S. (J.H.Barbour & Sons,Ltd., Christchurch,New Zealand). Chemicals and application for the control of weeds in brassicas. Proc.13th N.Z.Weed Control Conf., 1960, 47-51, tabs.1,bibl.4.
In trials in the South Island on light, sandy loam soil infested with Chenopodium album, swedes were grown on ridges and treated with the following herbicides applied over the ridge in bands 8 in. wide: chlorpropham 2 and 4 #, CDEC 2.4 and 4.8 #, CDAA 4.8 and 9.6 #, urea/carbamate (16.5% cyclooctyl dimethylurea + 11.5% butinyl-m-dichlorophenyl carbamate) 0.6 and 1.2 #, EPTC 3.6 and 7.2 # and TCA 10 and 20 #. Each treatment was applied with the following 3 nozzle types: (a) standard fan, (b) even-density spray, oblong pattern and (c) light-centre. Types (b) and (c) were designed specifically for band spraying. The soil at the time of treatment was moist and >4 in. rain fell in the 4 weeks after treatment. Chlorpropham 4 # gave the best control of C. album; treatment with nozzle (a) resulted in severe crop injury, while that with nozzles (b) and (c) caused only a slight and transitory check to growth. Control of C. album with nozzles (a) and (b) was similar and slightly superior to that with (c). TCA 20 # gave satisfactory control of C. album, using nozzles (b). CDEC also showed promise. - P.J.B.
[O.W.]

446. STEPHEN, R.C. (Dep.Agric.,Balclutha, New Zealand). Weed control in brassica forage crops in S. Otago. Proc.13th N.Z.Weed Control Conf., 1960, 29-33, tabs.4,bibl.1.
The results are given of trials in 1 season in S. Otago in which rape was treated pre-em. with chlorpropham 0.5, 1 and 2 # a.e., CDEC 2 # a.e., EPTC 2 # a.e. and CDEC 2 # + chlorpropham 0.5 #, all in 20 gal spray 4 days after sowing, post-em. applications of monochloroacetic acid (MCA) 15 # in 35 gal spray either at 9 days or at 40 days after sowing, or sodium nitrate 240 # in 200 gal spray 24 days after sowing. Inter-row cultivation (once) of the ridges was also carried out 40 days after sowing. No rain fell for at least 3 days after each treatment. Pre-em. treatments with chlorpropham 0.5 and 1 # and the chlorpropham + CDEC mixture completely prevented the establishment of Spergula arvensis, but not that of Leontodon autumnalis; no reduction in the density of rape was noted with these treatments but yields (1830, 1860 and 1960 lb dry matter/ac respectively) were considerably lower than those of the cultivated plots (2860 #). The MCA treatments were ineffective. The sodium nitrate treatment checked the growth of S. arvensis for a time and caused some reduction in rape stands, but yields (2230 #) were nearly as high as those where row cultivation was used. It was concluded that where S. arvensis, L. autumnalis, Polygonum aviculare and seedling Rumex spp. are a problem in brassica crops, best control can be achieved by inter-row cultivation or, where weed infestations are heavy, chlorpropham 1 # pre-em. - P.J.B.
[O.W.]

447. DAVIES, S.N. (Dep.Agric.,Wellington, New Zealand). Crop production in chemically killed turf. Proc.13th N.Z.Weed Control Conf., 1960, 102-7, bibl.4.
In the trials reported, which were carried out in the North Island, marrow-stem kale, swedes and turnips were sown in the 1958-59 and 1959-60 seasons on sward treated as follows: (a) rotary cultivation only, (b) rotary cultivation + sodium monochloroacetate, (c) dalapon 10 # + amitrole 2 # 14 days before sowing, (d) as for (c) but amounts of 5 and 2 # respectively. Other variables were low and high sowing rates, in combination with drilling and broadcasting and N applications, or no N. Herbicidal rates for (d) were insufficient to give satisfactory sward kill. The results indicated that good crops of kale, swedes and turnips could be grown on killed swards without prior cultivation; results with swedes and turnips were particularly good. Drilling gave better results than broadcasting and the need for a drill adapted for sowing into killed swards is stressed. High sowing rates were an insurance against adverse weather conditions. - P.J.B.
[O.W.]

448. WORSHAM, A.D., UPCHURCH, R.P. and TOOLEY, W.G. Chemical weed control in cotton. Folder N. Carolina agric.Ext.Serv., 1960, 178, pp.3, figs.3,tabs.1.
Recommendations are given for the pre-em. use of chlorpropham and diuron and of diuron for late-season weed control. - P.J.B.
[48(75.6)]

449. POINTEL, J.G. Les herbicides en culture cotonniere. [Herbicides in cotton growing.] Agron.trop.Nogent, 1960, 15,(1), 38-46, (F.e.span.), tabs.5.
Karmex (monuron 30%) pre-em. at 2, 2.5 and 3 l/ha and chlorpropham at 4 l/ha either alone or with 1 or 2 hand cultivations, did

not give such efficient weed control in cotton as the normal 3 or 4 cultivations alone, and crop yields were lower. PCP 11 l/ha + gas oil 11 l/ha and dinoseb pre-em. gave improved results, but also required 1 or 2 cultivations to give control equal to that obtainable from 4 cultivations alone. Diuron 1 kg/ha gave best weed control, and reduced the amount of hand weeding required to an economic level. - P.C. [C.A.]

450. ABEL, A.L. (Fisons Pest Control Ltd., Saffron Walden, Essex, England). The importance of herbicide rotation in agricultural practice. Proc.4th internat.Congr.Crop Protect.1957, 1959, 467.
There is stated to be some evidence that individual species of weeds develop a resistance to growth regulator herbicides, but still more evidence of changes in weed flora as a result of greater development of species not killed by treatment. Spraying and crop programmes should therefore be arranged so as to provide a sequence of different herbicides. - P.C. [O.W.]

451. SLAATS, M. and STRYCKERS, J. (Rijkslandbouwhogeschool, Gent, Belgium). Empfindlichkeit verscheidener Grünlandkräuter gegen Wuchsstoffherbizide. [Sensitivity of different grassland plants to growth-regulator herbicides.] Proc.4th internat. Congr.Crop Protect.1957, 1959, 513-4. (G.)
The stages of growth at which different weeds of grassland are most sensitive to growth regulator herbicides are reviewed, together with the best herbicide (among MCPA sodium, 2,4-D sodium, amine and ester, MCPB, 2,4-DB and 2,4,5-T) for the control of particular weeds. - P.J.B. [O.W.]

452. DIERCKS, R. and JUNKER, H. (Bayer. Landesanst. Pflanzenb.u.Pflanzensch., Munich, Germany). Fortschritte in der Technik der Ampferbekämpfung (II. Mitteilung). [Progress in the technique of controlling docks, (2nd Report). Prakt.Bl.PflBau., 1960, 55, (4), 105-17, figs.4, tabs.5, bibl.2.
Trials were carried out in 1959-60 to determine if the use of lower rates of mecoprop than those used previously would effectively control Rumex spp. in pasture; and whether, in view of possible damage to clover by mecoprop, MCPA and/or MCPB could be used without loss of effectiveness. Spot spraying using a tank with 5 hand-operated nozzles and instant cut-off, using mecoprop at normal concentrations gave up to 100% control from single applications.
Follow-up applications in the second year were seldom necessary. Spraying in spring and early autumn was more effective than in summer. 2,4-DP salt, 2,4-DP + MCPA + mecoprop salt, TB [2,3,6-TBA] + MCPA salt were compared with mecoprop ester, at 50 ml/plant. All gave 90% control but only mecoprop gave 100%. There was 90% reduction in stands of dock following overall spraying with mecoprop. This cost slightly less than spot-spraying plants, but caused more damage to the clovers. - P.C. [272(43)]

453. GOODCHILD, N.E. (Dep.Agric., Brisbane, Queensland Australia). Beat mat grass with pasture renovation. Qd agric.J., 1960, 86, (9), 529-30.
Grazing, ploughing and fertilizing with a 10:10 fertilizer at 1, 2 and 4 bags/ac + oversowing with white and red clover each at 2 lb greatly reduced the Axonopus affinis which had heavily infested a paspalum [Paspalum dilatatum]/kikuyu [Pennisetum purpureum] pasture and encouraged vigorous growth of the paspalum and kikuyu; sward height and density reflected the amount of fertilizer given. Clover growth was, however, poor and failed to recover from the bad start. Observation over the first 2 years following treatment indicated that further ripping and fertilizing would give greater control of the A. affinis. - D.M.L.S. [O.RE.]

454. GATES, D.H. and ROBOCKER, W.C. (Washington State Univ., Pullman, Wash., U.S.A.) Revegetation with adapted grasses in competition with dalmatian toadflax and St. John's wort. J.Range Mgmt, 1960, 13, (6), 322-6, figs.2, tabs.2, bibl.10.
Trials were carried out during 1957-60 to assess the importance of the ecological relationship between St. John's wort [Hypericum perforatum] and dalmatian toadflax [Linaria dalmatica]. The experimental sites were in a district with a flora in which a Pinus ponderosa-Agropyron spicata association predominated. Eight plots were sown with forage grasses, mainly fescues [Festuca spp.] and wheat grass [Agropyron sp.]. Seed of L. dalmatica was sown by hand on half of each plot of which some were cultivated and some not; H. perforatum was sown on the other half of each plot. All sowings on non-cultivated plots were considered failures, but on the cultivated sites seedlings of L. dalmatica were abundant. There was an average of 4 times as many plants of this

species on the non-H. perforatum sites as on the H. perforatum sites. These data suggested that the prior presence of H. perforatum plants on the cultivated areas may have restricted the establishment of L. dalmatica. Weed competition appeared to have little effect on the sown grasses. P.C. [O.W.]

456. TORELL, P.J., ERICKSON, L.C. and HAAS, R.H. (Idaho agric.Exp.Sta., Parma, U.S.A.) The medusahead problem in Idaho. Weeds, 1961, 9,(1),124-31, figs.4, bibl.9.
Medusahead (Elymus caput-medusae) is estimated to infest >700 000 ac of Idaho. It has supplanted Bromus tectorum in many areas, competes strongly with remaining perennial grasses and forbs and has invaded established stands of Agropyron desertorum and A. intermedium. Factors contributing to the competitive ability of medusahead are its prolific seed production, the high degree of seed viability and ready germination, seedling vigour, its unpalatability to livestock, low rate of litter decomposition, and its ecological amplitude. The value of burning as a measure for removing medusahead litter and enhancing the effectiveness of tillage and herbicidal treatments is discussed. - P.J.B. [O.W.]

457. SNYDER, L.W. and ALLEY, H.P. (Wyoming Agric.Exp.Sta., Laramie, U.S.A.) Soil-moisture retention and snow-holding capacity as affected by the chemical control of big sagebrush (Artemisia tridentata Nutt.). Weeds, 1961, 9,(1),27-35 figs.1, tabs.6, bibl.9.
The trials reported were carried out in the Big Horn Mountains (alt. 8200 ft; annual precipitation 20 in.) and the Red Desert (alt. 7000 ft; annual precipitation 10 in.) of Wyoming. Plots of sagebrush were treated with 2,4-D esters in June, 1957. Moisture contents in treated plots in the Red Desert in the year after treatment (3 sampling dates) averaged 1.7% (absolute) and 63.8% (relative) greater at depths down to 19 in. than on untreated plots. Differences were greatest at the 18-19 in. soil depths and at the July sampling (4.3% absolute at the 18-19 in. depths). In June-July, 1959, 2 years after treatment, moisture contents at the 18-19 in. depths in treated plots averaged 3.2% absolute (34.7% relative) greater than untreated plots. In the Big Horn Mountains, at 6 years after treatments which produced complete control of sagebrush, treated plots at 2 locations had 4.6% and 2.7% (absolute) higher moisture contents, respectively, at the end of July than did untreated plots; in both cases, the differences were significant. In the Red Desert areas, where drifting of snow is usual, control of sagebrush had no effect on snow holding capacity. In the Big Horn Mountains, areas on which sagebrush was controlled retained snow longest in spring. Controlling sagebrush in strips of different widths had no apparent effect on snow-holding capacity. - P.J.B. [O.W.]

458. MEEKLAH, F.A. (Invermay Res.Sta., Mosgiel, New Zealand). Application of 2,4-DB to mature lucerne. Proc. 13th N.Z.Weed Control Conf. 1960, 82-9.
The results are given of 5 trials in which lucerne stands 1 to 5 years old were treated with 2 4-DB at 40% a.e. potassium salt and 25 and 40% a.e. sodium salt formulations at rates of 1-3 # a.e. Weeds present consisted mostly of Poa annua and Rumex spp. Where grass and broad-leaved weeds were not a factor, 2,4-DB applied to actively growing lucerne reduced dry matter yields by up to 15%; there was little difference in effect between crops sprayed early (2-5 in. tall) and late (>7 in.). Where there was competition from grass weeds, 2,4-DB reduced yields by up to 21%. Applications made before active growth of lucerne began had little effect on yields. Lucerne showed tolerance to the 25% sodium salt formulation, but there was no clear indication of its effectiveness against weeds. The addition of dalapon at rates of 1.5-3 # to 2,4-DB reduced total yields, but neither herbicide affected the control of weeds brought about by the other. 2,4-DB gave unsatisfactory control of Rumex spp., as based on assessments at the end of the season. - P.J.B. [O.W.]

459. SEWELL, T.G. (Dep.Agric., Gore, New Zealand). Weed control in lucerne. Proc. 13th N.Z.Weed Control Conf., 1960, 90-4.
Trials in Eastern Southland indicated the need for correcting nutrient deficiencies (in this case potassium) before benefits could be expected from the use of dalapon for controlling annual grasses. Applications of dalapon 5 # + TCA 5 # in spring were effective for prolonging the productive life of old lucerne stands invested with annual grasses. Results with 2,4-DB indicated that there was little use for this herbicide in lucerne, except for controlling Cirsium lanceolatum. For young stands of lucerne (1 to 2 years old), dalapon 3.5-4.5 # gave adequate control of Poa annua and Agrostis sp.; in stands 2 to 3 years old rates of 4-5 # were required. Where Holcus

lanatus and H. mollis were present, 5-7 # were required for their control. - P.J.B. [O.W.]

460. McCARTY, M.K. and SAND, P.F. (Nebraska Agric.Exp.Sta.,Lincoln,U.S.A.) Chemical weed control in seedling alfalfa. 3. Effect of some herbicides on five varieties. Weeds, 1961, 9,(1),14-19, tabs.5,bibl.5.

In trials in Nebraska on silty clay loam soils in 1957 and '58, Buffalo, Grimm, Ladak Ranger and Vernal lucerne were sown in mid-April of each year. Applications of 2,4-DB 1 and 4 #, dalapon 2 and 8 # and 2,4-DB + dalapon mixtures at 1 + 2, 2 + 4 and 4 + 8 #, respectively, were made in 20 gal spray at about 3 weeks after the lucerne had emerged and was 2-4 in. high. Control plots were either not weeded, or hand-weeded to remove either grass or broad-leaved weeds, or both. Principal grass weeds were Setaria viridis, S. lutescens and Echinochloa crus galli and broad-leaved weeds Amaranthus retroflexus, Chenopodium album and Kochia scoparia. No treatment injured any variety in 1957. In 1958, 2,4-DB + dalapon 4 + 8 # resulted in a fairly uniform stand reduction in all varieties. In 1957, when grass weeds predominated, all the 2,4-DB + dalapon treatments resulted in highly significant total dry matter yield increases (July and September harvests) compared with the unweeded controls. In 1958, when broad-leaved weeds predominated, the 2,4-DB 1 and 4 # and 2,4-DB + dalapon 1 + 2 # treatments resulted in highly significant yield increases. The combination of 2,4-DB + dalapon gave good control of all weed species. The yield increases brought about by hand-weeding and herbicides were similar. P.J.B. [O.W.]

461. MARTIN, G.J. and TURNER, B. (Dep. Agric.,Hobart,Tasmania). Pasture seed certification. Conditions governing seed production. Tasm.J.Agric., 1960, 31,(2), 235-41,figs.3,tabs.2.

The purity and germination standards for certified pasture seeds are tabulated. The full list of "prohibited" and "restricted" seeds is contained in the regulations under the State Seeds Act 1950. It includes the following which are those most likely to be found in Tasmanian pasture species: (1) Prohibited - onion twitch [Arrhenatherum elatius var. bulbosum], white weed [Cardaria draba], Californian thistle [Cirsium arvense], variegated thistle [Silybum marianum], charlock [Sinapis arvensis], wild radish [Raphanus raphanistrum], bladder campion [Silene cucubalus], bindweed [Convolvulus arvensis], ragwort [Senecio jacobaea], ox-eye daisy [Chrysanthemum leucanthemum]; (2) Restricted - slender thistle [Carduus pycnocephalus], spear thistle [Cirsium vulgare], wireweed [Polygonum aviculare], stinking mayweed [Anthemis cotula], South African onion weed [? Asphodelus fistulosus], wild mignonette [Reseda luteola], hedge mustard [Sisymbrium officinale], wild turnip [?Brassica tournefortii]. - D.M.L.S. [O.RE.]

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See also 542.

462. JANYSKA, A. (Res.Inst.for Vegetable Crops,Olomouc,Czechozlovakia). Herbicidy v kulturach cibule, mrkve a petrzele. [The use of herbicides in onions, carrots and parsley.] Vedecke Prace vyzkumneho ustavu zelinarskeho CSAZV v Olomouci, 1961, 1,119-29, tabs.3,bibl.20.

Field trials were carried out in 1958 and 1959 on a heavy loam with the following herbicides: Alisan (potassium cyanate), Nitrosan (25% DNOC-sodium), dinoseb (20%), Prevenol 56 (25% chlorpropham) and Prevenol-Spezial (chlorpropham + monuron). In carrots and parsley, best results were obtained with pre-em. application of Prevenol 56 at 16 l/ha in a volume of 300 l/ha. Yields were increased 30-40% compared with untreated control. The same material at 12 l/ha also gave the best results in onions, increasing the yield 91% compared with untreated control and giving a lower % of bullnecked bulbs. The use of Alisan was uneconomic on early-sown onions because only a small proportion of the weeds had emerged at the time of application. Nitrosan and dinoseb applied post-em. (onions 6-8 cm) resulted in slight temporary damage. It is concluded that herbicides do not replace cultural methods of weed control, but considerably reduce the need for them. - H.A. Roberts. [NVRS]

463. THOMPSON, F.B. (Rukuhia Soil Res.Sta., Hamilton,New Zealand). Tolerance of crops and weeds to new chemicals. Proc.13th N.Z.Weed Control Conf., 1960, 71-5, tabs.2, bibl.2.

In trials to assess their value in New Zealand, a logarithmic sprayer was used

to apply amiben, fenac, CDAA, CDEC, CDEA, EPTC, trietazine and simazine to carrots, onions, beet, lettuce and marrow stem kale. Amiben 4 lb gave almost complete weed control on both sandy and peaty soils; Rumex acetosella and Portulaca oleracea were reduced by 3 lb and 2 lb, respectively. Chlorpropham, CDAA and EPTC 4 lb were applied to carrots, both soil incorporated, pre-sowing and pre-em.; amiben gave slightly better weed control than chlorpropham (especially of Amaranthus retroflexus and Chenopodium pumilio), and much better than CDAA or EPTC. Chlorpropham, however, gave better control of Spergula arvensis and grasses than did amiben; carrots were equally resistant to both. Of crops treated pre-em., marrow stem kale was the most and onions the least resistant; the former tolerated amiben at rates up to 5.5 lb.

Fenac 3.7 lb gave complete control of weeds on both peaty and sandy soils, and 1.5 lb was sufficient to control S. arvensis and P. oleracea. CDAA 3 lb was sufficient to control weeds on peaty soil, but a much higher rate [not stated] was required on sandy soil. On peat, 2 lb controlled Amaranthus retroflexus; marrow stem kale and onions tolerated CDAA 3 lb but turnip and beet were more susceptible. CDEA 4 lb gave no control of S. arvensis, P. persicaria, Coronopus didymus or Poa annua. In trials on marrow stem kale, CDEC 8 lb did not control broad-leaved weeds, but lower rates eliminated Panicum capillare; on lettuces, 4 lb caused more crop damage than amiben or chlorpropham, with less control. EPTC acted similarly. Trietazine 3 lb applied to fodder beet immediately post-planting damaged the crop, but gave good control of A. retroflexus and Chenopodium pumilio. Simazine 4 lb controlled weeds, but damaged crops. Mixtures showed no advantages over the herbicides used singly. - P.C. [O.W.]

464. ORSENIGO, J.R. (Florida Agric.Exp. Sta.,Gainesville,U.S.A.) Resume of recent herbicide research on organic soil. Mimeo. Rep.Florida Everglades Sta., 1960, 60-18, pp.5.

In post-transplanting (before weed emergence) trials in celery using CDAA 4, 5 or 6 quarts/sprayed ac and CDEC 4, 5 or 6 quarts and mixtures of CDAA 2 or 3 quarts + CDEC 2 or 3 quarts, CDAA or CDAA + CDEC gave better control of grass weeds than CDEC alone. No treatment significantly affected crop yields. In further trials, CDAA and CDEC treatment were applied immediately after transplanting and again 2-3 weeks later. Repeat treatments gave better weed control than a single, initial treatment and CDAA again was superior to CDEC. In post-em. trials on celery seedbeds, Karsil [N-(3,4-dichlorophenyl)-2-methylpentanamide] at rates up to 3 lb gave effective control of a range of seedling weeds. Celery seedlings with less than 3 true leaves when sprayed were stunted; larger seedlings were stunted temporarily, but were equal to untreated plants at transplanting. At harvest, Karsil had no effect on crop yields. In field trials, Karsil post-em. at 3 or 4 lb controlled emerged seedling weeds for 3-4 weeks after setting; the maturation of treated crops was delayed for 3-5 days in some cases. Karsil 3 lb + CDEC 3 lb gave very good weed control, but crop injury was greater than with Karsil alone. - P.J.B. [46(75.0)]

465. GUZMAN, M.E. Uso de herbicidas en los cultivos de zanahoria y chicharo en el Valle de Toluca, Mex. [The use of herbicides in carrots and peas in the Valle de Toluca Mexico.] Agric.tec.Mex., 1959-60, 9, 15.

In a preliminary trial in which monuron neburon, and a mixture of chlorpropham + naphtha were used on carrots, and monuron, dinoseb, chlorpropham + dinoseb, MCPA (amine) and 2-chloro-4,6-bis-(diethylamino)-s-triazine on peas, the best results in carrots were obtained with 2 l chlorpropham in 800 l naphtha and with monuron 0.250 kg/ha, both applied in the 2-leaf stage. In peas MCPA (amine) and monuron injured the crop at all rates; the best results in terms of both weed control and pea yield were obtained with a 1:3 mixture of chlorpropham + dinitro. - D.M.L.S. [Md.H.]

466. MONTILLA, J.A. and CHICCO, R.J. Cultivo de la cebolla. Effecto de las escardas sobre sus rendimientos. [Onion growing. Effect of weeding on yield.] Ing.Agron.(Venez.), 1960, 4,31-3, (Span.) figs.3,tabs.2,bibl.11.

In a trial in which the following treatments were compared - (1) herbicide (chlorpropham) treatment as needed and no hoeing, (2) 1 hoeing + herbicide, (3) 2 hoeings, and (4) 3 hoeings - the results failed to give conclusive evidence that movement of the soil around the onion bulb (by hoeing) has no beneficial effect other than that of weed control although yields were not significantly increased by such movement. - D.M.L.S. [9(87)]

467. KOBASHI, S.J. El uso de herbicidas selectivos en la zanahoria. [The use of selective herbicides in carrots.] [From summary in] Proc.Carib.Reg.Amer.Soc.hort. Sci., 1957, 1958, 5,61, (Span.)
In a comparative trial in Mexico 2 applications of naphtha at 1400 l/ha each proved equivalent in effect to 1 handweeding but more costly. Distilled petroleum at 1200-1600 l/ha was as effective as handweeding, but cheaper. - D.M.L.S. [Md.H.]

468. MACGILLIVRAY, J.H. (Dep.Veg.Crops Univ.California,Davis,U.S.A.) Effects of chemical defoliation of canning tomatoes. Proc.Amer.Soc.hort.Sci., 1960, 75,625-8, tabs.5,bibl.1.
Defoliation of tomato plants with sodium chlorate (practised in late-maturing crops) had only slight effects on picking time, yield, grade, fruit temperature and rate of fruit ripening. - P.J.B.
[204(79.4)]

469. IZARD, C. and BERG, T.M. Une nouvelle methode d'identification des virus de la mosaique du tabac et X de la pomme de terre. Par chromatographie sur papier: Application a l'etude des relations entre l'orobanche et le tabac, en presence de ces deux virus. [A new method of identifying tobacco mosaic and potato X viruses by paper chromatography; its application to a study of the relations between broom rape and tobacco in the presence of these two viruses.] Ann.Inst.exp. Tabac Bergerac, 1959, 3,215-25, (F.e.), figs.4,tabs.2,bibl.8.
The method of identification is described. It appeared from a trial in which this method was used that it is not possible to transmit the 2 viruses by direct inoculation of broomrape. In addition, tobacco mosaic virus is not apparently transmitted from tobacco to the broomrape. Tobacco plants parasitised by broomrape show only slight symptoms of the diseases. - D.M.L.S.
[Md.H.]

470. GREAT BRITAIN, LONG ASHTON AGRICULTURAL AND HORTICULTURAL RESEARCH STATION, BRISTOL. Rep. 1959, pp.171.
p.23. Records from blackcurrant plots sprayed the previous year with 2,4,5-TB and MCPB for the control of Convolvulus arvensis showed improved cropping on all plots compared with the cultivated controls, although July applications of MCPB had caused considerable damage to the bushes. In fruit tree nurseries mixtures of 2,4-DES 4 % with monuron, simazine or dalapon at 2 % gave good control of annual weeds without crop injury. Dalapon 5 % applied in March or April gave satisfactory control of Agropyron repens amongst cordon apple trees without completely killing the grass cover thus avoiding reinvasion by other weed species.
p.39. Basket willows. Foliar applications of 2,4,5-TB 250-1000 p.p.m. for the control of Calystegia sepium damaged young shoots of potted willows (var. Black Maul) treated in May and June and also rods of 34 in. sprayed in the field in July; the highest rate caused premature leaf fall and considerable die-back. Damage was also caused by the June spraying of second year rods (var. Newkind) averaging 4.5 ft in height. Dalapon 4 lb/100 gal gave good control of Agropyron repens and other grasses in willow beds, though better results were obtained with 6 and 8 lb. Two varieties of Salix viminalis showed temporary leaf scorch but no damage was observed on any of 25 varieties of S. triandra. - D.M.L.S. [O.RE.]

471. DANA, M.N. (Dep.Hort.,Univ.Wisconsin, U.S.A.) Dalapon for weed control. Cranberries, 1960, 24,(12),11-12.
Rates as low as 1-3 % of dalapon, applied either after harvest in autumn or before flowering in spring, may considerably reduce cranberry yields. However, autumn or spring application (preferably autumn) of 10-12 % may be beneficial on weedy, unproductive areas infested with bunch grass, wide leaf grass [Carex rostrata], and round weed, although it will cause the loss of the next crop. Summer application results in excessive injury to vine foliage. The most successful rate for swab treatments has been ca. 2 lb/5 gal water at ca. 2 gal/ac. - D.M.L.S.
[71(77.5)]

472. NETHERLANDS, PROEFSTATION VOOR DE BLOEMISTERIJ TE AALSMEER. Jaarversl. Proefst.Bloem.,Aalsmeer,1959, (n.d.), 60-1, (Du.).
Chrysanthemum. The following were applied on 17th July after planting on 3rd July: simazine 1 and 2 kg/ha, monuron 1 and 2 kg, chlorpropham 5 and 7.5 l/ha, propham 10 kg/ha, simazine granular 30 kg and chlorpropham granular 40 kg/ha. Simazine and monuron sprays both gave effective weed control and were superior to the other materials, but monuron injured the crop, as did the higher rate of simazine initially. Chlorpropham gave adequate weed control with no crop injury. The low rainfall severely limited the effect-

ness of the granular materials.

Forsythia. Pruned bushes were treated when they had sprouts about 10 cm long with the following: simazine 1, 2 and 3 kg/ha, monuron 1, 2 and 3 kg/ha and chlorpropham 5, 7.5 and 10 l/ha. The plots were hoed a few days before herbicidal treatment. The highest rates of simazine and monuron both caused leaf discoloration initially, but this later disappeared. The two highest rates of simazine and monuron both maintained weed-free conditions for 4 months. The effectiveness of chlorpropham was somewhat reduced by dry conditions.

Helleborus. From the results of trials with 3-year-old crops, it was concluded that weed control in Helleborus was possible with PCP (5% in oil) before eye-opening and some weeks later (post-em.) with simazine at 1 kg/ha (0.1% solution).

Lilac. A number of green manure crops were tested as means of preventing weed growth under lilac. Lilac was planted on 15th May, a few days after PCP application, and green manure crops sown on 17th June. Under the dry conditions of this year, turnip were the most effective crop, followed by spurry. -P.J.B. [Md.H.]

473. van der GRAAF, A.J. Vergelijking van onkruidbestrijdingsmiddelen op geplante pioenen. [A comparison of herbicides for peonies.] Jaarb.Proefst.Boomkw.Boskoop, 1959, 80-1, (Du.).

In trials with autumn-planted peonies, simazine 0.5, 1 and 2 kg/ha as 50% wettable powder and 2 kg/ha in 50 kg granules, chlorpropham as liquid 4 l/ha, wettable powder 4 kg/ha, and 4 kg/ha in 32 kg granules, Orga 201 (chlorpropham + simazine) 8 kg and contact herbicides were applied. Simazine 1 kg gave satisfactory control of weeds until the following March, when a further application at 3 kg/ha could be applied. Granular simazine was also effective, but difficult to apply, and was not recommended where water supplies were adequate. Where it was not desirable to use simazine, chlorpropham + INOC was recommended. - P.J.B. [Md.H.]

474. DETROUX, L. and NEURAY, G. (Sta. Phytopharmacie, Gembloux, Belgium). Essais de desherbage selectif du glaieul. [Selective weed control trials in gladioli.] Meded. Landbhogesch.Gent, 1959, 24, (3/4), 881-92, figs.3, tabs.4, bibl.3.

Trials during 3 years are described in which the following herbicides were used: pre-em.- monuron 0.75, 0.8 and 1.6 kg/ha, neburon 1.11, 2.22 and 4.44 kg/ha, simazine 0.5, 1 and 2 kg/ha and 2,4-DES 3.6 kg/ha (2 applications); post-em. - MCPA 0.4 and 0.8 kg/ha, simazine 0.5 and 1 kg/ha and neburon 1.1 and 2.2 kg/ha. The best and most lasting weed control was given by pre-em. applications of simazine 2 kg/ha, neburon 4.4 kg/ha and monuron 1.6 kg/ha in that order, all of which gave excellent annual weed control but were less effective against perennials. The post-em. results were much less effective than the pre-em. The only treatment to cause injury was MCPA at 0.8 kg/ha. - D.M.L.S. [105(493)]

475. CHIAPPARINI, L. (Osservatorio Fitopatologico, Milan, Italy). Risulti di alcune prove di diserbo chimico selettivo in pre- and post-emergenza delle tuberose e dei gladioli da fiore. [Results of some tests of selective herbicides pre- and post-emergence in tuberose and gladiolus.] Notiz.mal.Piante, 1960, 53, 19, figs.1, tabs.2, bibl.4.

To assess the commercial possibilities of chemical weed control in flower-bearing bulbs, trials were carried out on tuberose [Polyanthus tuberosa] and gladiolus [Gladiolus sp.]. P. tuberosa was grown on clay, and the Gladiolus sp. on light friable soil. The following herbicides were applied pre- and post-em. in 1959 and 1960: diuron, neburon, CDAA, CDEC, 2,3,6-TBA, amitrole + chlorpropham, and OMU + BiPC (cyclo octyl dimethyl urea + butinol chlorophenyl carbamate). Dinoseb was applied post-em. only.

Amitrole + chlorpropham 2.8 kg/ha a.e. applied in 600 l/ha water in May, and followed 2 days later by planting gave 75-85% control of both mono- and dicotyledonous weeds. Neburon 1.1 kg/ha a.e. was less persistent in the lighter soil, and caused some crop damage. CDAA and CDEC at 7 kg/ha a.e. caused slight crop damage and were less effective against weeds than amitrole + chlorpropham, especially on sandy soil. 2,3,6-TBA 13 kg/ha a.e. gave good weed control but caused more crop damage than amitrole + chlorpropham. OMU 0.825 kg/ha + BiPC 0.575 kg/ha a.e. gave weed control equal to amitrole + chlorpropham, with no significant crop damage. The latter mixture and 2,3,6-TBA were most effective when applied after the weeds had emerged, whereas diuron and OMU + BiPC gave best results if applied before weed emergence. - P.C. [69(45)]

476. BING, A. (Ornamentals Lab., Farmingdale, New York State, U.S.A.) What you should know about weed control. Bull. N.Y. State Flower Grs', 1960, 169, 1,4.

Methods of soil sterilisation are discussed and a brief account given of results from studies on Long Island in the following ornamentals: gladioli, peonies, dahlias, roses, azaleas, chrysanthemums, asters and carnations.

Diuron 2.5-5 # in 100 gal water has given good to excellent control of Oxalis sp. and has caused no injury to Cymbidium orchids at rates up to 16 #. Diuron cannot be used in chrysanthemums. - D.M.L.S. [129(74.7)]

477. AHRENS, J.F. and OLSON, A.R. Prevention and control of crabgrass in lawns. Bull. Connecticut agric. Exp. Sta., 1961, 642, pp.8, tabs.1.

In trials with post-em. (weeds) treatments in 1960, disodium monomethyl arsonate at 4 # in mid-June gave 95% control of Digitaria sp. by mid-July, but none by September; a repeat treatment in mid-July resulted in 30-40% control by September. These results were considered to show the need for repeat treatments with this material. Ammonium monomethylarsonate at 3.5 # applied in late June and again in mid-July gave about 70% control of Digitaria sp. by September. In trials in 1960 in which herbicides were applied pre-em. (weeds) to established turf consisting mainly of Poa pratensis with some Agrostis spp. and Festuca spp., Zytron (O-(2,4-dichlorophenyl) O-methylisopropylphosphoramidothioate) at 20 #, and Dacthal (dimethyl-2,3,4,6-tetrachloroterephthalate) at 10 #, applied on 28th April both gave >95% control of Digitaria sp. by the following September. Calcium arsenate also gave excellent control when applied at or just before the Digitaria sp. emerged. Neither Zytron nor Dacthal caused any turf injury. The results of comparable trials at other locations are reviewed. Zytron and Dacthal have also given good control of Digitaria sp. when applied in autumn, though both herbicides have injured Festuca rubra and Agrostis sp. in some trials. - P.J.B. [24(74.6)]

478. van der GRAAF, A.J. De invloed van simazin op het blad. [The effect of simazine on leaves.] Jaarb. Proefst. Boomkw. Boskoop, 1959, 81-3, (Du.)

In trials in 1959, Ligustrum ovalifolium (which had shown evidence of foliar injury following simazine treatments in 1958) cuttings were planted out on fen soil on 10th April. Simazine (10 kg commercial product/ha) was then applied to the soil, to the soil and to the cuttings or to the cuttings only, at 3 different times during the season, the first before and the next two after bud break. At 3 weeks after the last date of treatment (25th May), cuttings which were sprayed with simazine on the above-ground parts, only, showed clear evidences of injury (yellowing of leaf edges) and the extent of injury increased at the 8th week after treatment, indicating that simazine was taken up by the above-ground parts of the plants only. Plants receiving soil treatment, only, showed no evidence of injury. From these results, it was concluded that simazine should be applied to sensitive species before bud break. The yellowing of leaves caused by simazine did not appear to have any permanent effect on growth. Species showing relatively high sensitivity to simazine were: Cotoneaster conspicua, Deutzia gracilis, Eleagnus ebbinger, Euonymus alata, Ligustrum amurense, L. obtusifolium var. regelianum, L. quihoui, Symphoricarpus chenaultii and Syringa josikaea. - P.J.B. [M.R.]

479. JUSKA, F.V. (U.S. Dep. Agric., Beltsville, Maryland, U.S.A.) Pre-emergence herbicides for crabgrass control and their effects on germination of turfgrass species. Weeds, 1961, 9, (1), 137-44, tabs.4, bibl.3.

In glasshouse experiments with a number of pre-em. herbicides used for crabgrass [Digitaria sp.] control, fenac sodium salt and amide (4 or 6 #), arsenic complex + 7% N (1090 #) and chlordane [1,2,4,5,6,7,8,8-octachloro-4,7-methano-3a,4,7,7a-tetrahydroindane (52-260 #) remained toxic to Colonial bentgrass [Agrostis sp.] from 19th November to 19th February. Chlordane inhibited the germination of Poa annua more than that of Merion Kentucky bluegrass [Poa pratensis]. Calcium arsenate (350 and 520 #) gave better control of Poa annua in the field than in the glasshouse. In field studies with pre-em. herbicides all (including 2,3,5,6-tetrachloroterephthalate 4 #, O-2,4-dichlorophenyl O-methylisopropylphosphoramidothioate 20 #, calcium arsenate 520 #, lead arsenate 1090 #, arsenic complex + 7% N (1090 #), chlordane 87 # and chlordane on vermiculite 52 #) reduced the germination of Merion Kentucky bluegrass, red fescue [Festuca rubra], bentgrass [Agrostis sp.] and tall fescue [Festuca arundinacea] and affected their growth. Exceptions to this were diphenylacetonitrile 12 # and disodium monomethyl arsonate 15 #. Vegetatively planted grasses resisted the herbicides

better than did sown grasses and of vegetatively planted species, Cynodon dactylon was more resistant than Zoysia japonica and Agrostis palustris. Of sown species, Merion bluegrass and tall fescue seedlings were highly resistant to lead arsenate toxicity. Chlordane affected the germination of Merion bluegrass and Agrostis sp., but had little effect on red fescue and tall fescue. Pre-em. treatments with calcium arsenate and arsenic complex + 7% N effectively controlled crabgrass, but the latter injured the turf. Fenac and Chlordane were unsatisfactory against crabgrass. - P.J.B. [O.W.]

480. HAMILTON, K.C. Dalapon controls Bermuda grass. Rep. Arizona agric.Exp. Sta., 1958, 176, pp.3, figs.2.
Brief recommendations are given for the use of dalapon for renovating Bermuda grass [Cynodon dactylon] lawns and for controlling Bermuda grass runners along the edges of lawns. - P.J.B. [20(79.1)]

481. LARSEN, R.P. (Dep.Hort., Michigan State Univ., East Lansing, U.S.A.) Is chemical weed control a reliable practice for Michigan orchards? Ann.Rep.Michigan State hort.Soc., 1960, pp.7, bibl.5.
The use of herbicidal oils, dinoseb, monuron, diuron, dalapon, amitrole and simazine for controlling weeds round the bases of orchard trees is reviewed. In trials during 2 years in Michigan, simazine at 8 or 16 # applied in May gave excellent control of a wide range of weeds, including annuals and perennials. A single 16 # rate gave control for a 2-year period, but caused moderate chlorosis of the leaves of peach and cherry trees. Practical instructions for the use of herbicides in orchards are given. - P.J.B. [82(77.4)]

482. LIDER, L.A., LEONARD, O.A. and LIDER, J.V. (Univ.California, Davis, U.S.A.) Field trials with herbicides in vineyards. Calif.Agric., 1960, 14, (12), 11, 13, figs. 2, tabs.1.
In trials during 3 years in the San Joaquin Valley, California, diuron and simazine were applied in 4 ft bands in 200 gal spray to low-headed grape vines during mid-winter at rates of 4 # with or without additional rates of 2 # in early March. Rates given refer to the actual area of ground sprayed. Excellent weed control was secured, especially with the split application. It was concluded that the herbicidal rates used could be reduced after the first year with no detriment to weed control. Perennial weeds such as Ipomoea spp., Quercus spp. and grape seedlings were not controlled and it was thought that these would become an increasing problem with the use of these herbicides. A perennial mint [Mentha sp.] and Rumex acetosella were both controlled by diuron, but not by simazine. - P.J.B. [O.W.]

483. KRETCHMAN, D.W. (Univ.Florida, Gainsville, U.S.A.) Chemical control of perennial grasses in citrus groves. Proc.Fla State hort.Soc., 1959, 72, 21-9, figs.2, tabs.5, bibl.6.
The following treatments were tried in citrus groves for the control of Cynodon dactylon and Panicum purpurascens: (1) 3 applications of dalapon (sodium) (as Dowpon) at 1.48 # a.e. (intervals between applications were 2 days in all treatments except 1 at 1 location where 4-day intervals were allowed); (2) dalapon 2.96 # followed by 1.48 #; (3) dalapon 1.48 # + diuron (as Karmex) 6.4 # a.i. followed by dalapon 1.48 #; (4) dalapon 1.48 # + diuron 9.6 # followed by dalapon 1.48 #; (5) diuron 6.4 #; (6) diuron 9.6 #. The same treatments (except that in treatment (2) diuron 6.4 # was applied with the first dalapon application) were applied to Panicum hemitomon and P. maximum. In addition, the following treatments were applied to C. dactylon only (intervals between applications were of 2 weeks): (7) 2 applications of dalapon 4.99 #; (8) 4 applications of dalapon 2.49 #; (9) dalapon 4.99 # + diuron 4.99 #; (10) 2 applications of dalapon 2.49 # + diuron 2.49 #.
Treatment (1) gave 63-85% control of C. dactylon at 3 locations and 82% control of P. hemitomon at 2 locations for 6 months, and satisfactory control of P. purpurascens and P. maximum for 3 months, but not for 6; it caused very slight injury to citrus trees 4 and 12 years old, but none to trees 14 years old or older. P. hemitomon was also controlled by treatments (4) and (6) when sufficient rainfall occurred to leach the diuron into the weed's root zone; these treatments caused slight injury to 4-year old Valencia oranges on rough lemon stock. The best control for 6 months of P. maximum was given by dalapon 1.48 or 2.96 # + diuron 6.4 or 9.6 # followed by dalapon 1.48 #, but at 1 location cultivation 2 weeks after treatment apparently reduced weed control. The best control (50-72% for 6 months) of P. purpurascens was given by treatments (1) and (6).
The following treatments failed to control P. repens: 2 applications of dalapon 3.7 # alone or + 2,4-D (dimethylamine) 2 # or +

2,4,5-T (triethylamine) 2 % or + MH (diethanolamine) 5000 p.p.m. or + the potassium salt of gibberellic acid 1000 p.p.m.; sodium chlorate 800 %; and methoxy propazine (2-methoxy-4,6-bis(isopropylamino)-s-triazine 2 lb/gal) at 5 + 5 % and at 20 %. Intervals between applications were of 5 days. Fenuron 50 % a.i. (as Dybar) was very effective for 6 months in preventing encroachment of P. repens into a grove and no injury was observed on citrus trees 15 ft from the plots.

The susceptibility of citrus to dalapon and diuron is discussed and the symptoms of injury described. - D.M.L.S.

[44(75.9)

484. MOREZ, H. (Inst.Francais de Recherches Fruitieres Outre-Mer,6 rue General Clergerie, Paris 16,France). Le neburon dans le traitement des pepinieres arbustives tropicales. [Neburon in the treatment of tropical nursery shrubs.] Fruits, 1960, 15,(11), 488-90, figs.1,tabs.2.

Rates of 4.625 kg/ha caused no injury to young mangoes but checked growth of some transplanted butter orange seedlings which were not sufficiently woody to withstand the chemical. Cacao and coffee were uninjured. In another trial 4 kg/ha did not injure young citrus or mango. Control of weeds for 5 months was obtained provided application was made to weed-free ground. - D.M.L.S. [O.W.]

485. MUTHUSWAMY, R. (c/o Messrs.Begg, Sutherland & Co.Ltd.,Marhowrah,North Bihar, India). Control of Croton sparsiflorus Mor. in sugarcane fields by chemical method. Indian Sugar (Calcutta), 1960, 9,(12), 691-2,695-7, figs.2,tabs.5,bibl.3.

In a trial with commercial formulations of MCPA, 2,4,5-T and 2,4-D (acid and ester), 2,4,5-T was the most effective and gave about 90% control when applied post-em. and about 50% control pre-em. MCPA gave about 50% control pre-em. and about 30% control post-em. 2,4-D was ineffective. The deleterious effect of C. sparsiflorus on sugar cane growth by absorption of nutrients was demonstrated. (Doses of herbicides were not given in terms of a.e.). - D.M.L.S.

[Md.H.]

486. INDIA, INDIAN FARMING. Keeping down weeds in sugar cane. Indian Fmg, 1960, 10 (3),15.

In trials at Arabhavi, 2,4-D (as "Fernoxone") applied twice alone at 1.5 %, delayed germination and reduced it by ca. 5%, whereas when "Aretan",an organo mercurial compound, was applied in addition, germination was increased 12%. - D.M.L.S. [O.RE.]

487. BURSCHEL, P. (Inst.Waldbautecknik der Univ.Göttingen,W.Germany). Die Anwendbarkeit von Herbiziden in Forstbaumschulen. [The applicability of herbicides to forest nurseries.] Rep.Inst.Waldbautecknik, Göttingen, 1959, pp.34, tabs.26.

Experiments were carried out in 1957-58 to determine the value of the following herbicides in forest nurseries: MH, CDEC, CDAA, 2,4-DES, neburon, TCA, chlorpropham, dalapon, simazine, amitrole and NPA. Each was applied at 3 different rates in the first instance on newly-cultivated, weed-free soil. Assessments were made after 3 months on the basis of number, dry weight and species of weeds. On sandy soil, simazine gave best control at 2 kg/ha. In subsequent trials, lower rates were successful and on sandy soil simazine was effective at 0.5 kg/ha; chlorpropham 4 l/ha, neburon 10 kg/ha, and TCA 40 kg/ha were next in effectiveness. The granular and emulsion formulations of chlorpropham did not differ in selectiveness. Dalapon, amitrole and TCA were relatively ineffective, and were omitted from subsequent experiments. Of the other herbicides tested, 2,4-DES gave the best and MH the poorest weed control. Chlorpropham kept the soil free from weeds until the following summer when applied in late autumn or early winter. Experiments with pine seeds showed that chlorpropham 8 kg/ha reduced germination by 50-55%. Other herbicides in the series tested did not influence germination rates, but all caused severe damage to spruce and pine seedlings when applied immediately before sowing. Neburon 10 kg/ha pre-planting caused little damage, and simazine 2 kg/ha only slightly more. Seedlings treated with chlorpropham 4 l/ha during the quiescent period after their first season's growth were as resistant as older trees and 1- to 2-year old transplants were uninjured by even higher rates; simazine 2 kg/ha controlled weeds and allowed transplants freer growth. - P.C. [274(43)]

488. DONCEV, Z.V. Stavnitelni damni za vlijanieto na troskota (Cynodon dactylon L.) varhu darvesnite i hrastovite irdove v polezastitnite pojasi i Kulturite v Dobrudza. [Comparative data on the effect of C. dactylon on (young) tree and shrub species in shelterbelts and plantations in the Dobruja region.] Nauc.Trud.Lesotch. Inst.,Sofija, 1959, (7),339-65, bibl.9.

The following species are very susceptible to damage by Cynodon dactylon in the first year or two after planting: Robinia pseudoacacia, Fraxinus pennsylvanica, Gleditsia triacanthos, Morus alba and Tilia tomentosa. Species less affected are F. ornus, F. oxycarpa, Quercus borealis var. maxima, Q. cerris, Q. robur, Prunus mahaleb and Celtis australis. - For.Abstr., 21,4539.

489. van der LAAR, H.J. Chemische onkruidbestrijding op zaaibedden voor de opkomst. [Pre-emergence weed control by chemicals in seed-beds.] Jaarb.Proefst.Boomkw.Boskoop, 1959, 85-7, (Du.)

In trials in 1959, different contact, residual and contact + residual herbicides were applied to deciduous and conifer tree nursery seedbeds. Shell W at 800 l/ha gave excellent results, except with very shallowly sown seeds. PCP in oil (30 l/ha) was also effective with deep-sown seed of species such as Castanea, Corylus, Fagus and Quercus. With seed sown at >2 cm deep, Carburine (tractor fuel) at 800 l and diquat 1.5 and 3 l, were also effective and residual herbicides were safe to use only with seed sown as deep as this. Chlorpropham 4 l/ha, simazine 0.5 and 1 kg and Orga 222 (chlorpropham + simazine) 10 kg/ha were all effective, though Pinus sylvestris showed injury from chlorpropham and simazine and Picea abies to chlorpropham and Orga 222, but not to simazine. - P.J.B. [Md.H.]

490. van der LAAR, H.J. Chemische onkruidbestrijding in eenjarige vaststaande koniferen (zaarbedden). [Chemical weed control in year-old, non-transplanted conifers (seedbeds).] Jaarb.Proefst.Boomkw.Boskoop, 1959, 88-9, (Du.)

The following were applied in spring to year-old plants of 5 conifer species. Carburine (tractor fuel) 800 l/ha, Shell W oil 800 l, chlorpropham 4 l, Orga 222 (chlorpropham + simazine) 10 kg, simazine 0.5, 1 and 2 kg, Shell W oil 800 l + chlorpropham 4 l and Shell W oil 800 l + simazine 1 kg. Results with simazine 0.5 and 1 kg/ha were excellent, though weed control was difficult to assess in the dry conditions of this year. The other herbicides caused a lesser or greater degree of injury, though where weeds were already present and before shooting began, mixtures of Shell W oil + simazine could be used. Conifer species used were Picea sitchensis, P. pungens, Pinus mugo mughus, Thuja occidentalis and Tsuga heterophylla. - P.J.B. [Md.H.]

491. van der LAAR, H.J. Chemische onkruidbestrijding in een jarige verplante koniferen. [Chemical weed control in year-old transplanted conifers.] Jaarb.Proefst.Boomkw.Boskoop, 1959, 90-1, (Du.)

The following were applied to year-old plants of Pinus nigra var. calabrica (= var. corsicana) P. sylvestris and Pseudotsuga taxifolia (= P. douglasii): chlorpropham 4 l/ha, Orga 222 (chlorpropham + simazine) 10 kg, simazine 0.5, 1 and 2 kg, Carburine (tractor fuel) 800 l, Shell W oil 800 l and Shell W oil 800 l + simazine 1 kg. These were applied shortly after transplanting and, in some cases, before shooting began. Simazine 2 kg/ha caused little damage to the conifers and less than any other of the herbicides used; rates of 0.5 and 1 kg simazine gave unsatisfactory weed control as assessed in the following autumn; as assessed at this time, Shell W oil, with or without simazine, caused little injury to the conifers. P.J.B. [Md.H.]

492. LEONI, A. Esperimenti di lotta contro le erbe infestanti in un vivaio forestale con vecchio e nuovi diserbanti. [Weed control experiments in a forest nursery with old and new weedkillers.] Monti e Boschi, 1960, 11, (3), 101-21, (It.f.e.).

During recent years weed control in the forest nurseries of the Vita Mayer Paper Mill Company has been based on 2 main principles: (1) annual weeds are treated with mineral white spirits, and solutions and emulsions of Pine-tar oils; (2) couch grass [Agropyron repens] and perennial weed on fallow land and between rows in transplant beds are treated with amitrole, followed by accurate tilling. Solutions of Pine-tar oils in aliphatic hydrocarbons, and water-emulsifiable tar oils gave the best control of annual weeds. - For.Abstr., 21,4322.

493. MAPLE, W.R. (Southern For.Exp.Sta., Harrison, Arkansas, U.S.A.) Rotary cutter prepared pine seedbed for natural regeneration while clearing brush. Tree Plant.Notes, 1960, No. 40, 17-9, figs.3.

Four methods of preparing sites for Pinus echinata seedbeds were compared in N. Arkansas. As determined at one growing season after treatment, the use of a tractor-powered rotary brush cutter resulted in 7088 pine seedlings/ac, burning in 1362, chemical treatment in 1012, while control plots had 1200 seedlings/ac. The chemical treatment applied was 2,4,5-T (propylene glycol butyl ether ester) 4 lb a.e./gal in 16 lb ahg concentration in diesel oil, basal spraying of stems <4 in. d.b.h. and

spraying in frill girdles on larger stems. Any type of tractor can be used for pulling the rotary brush cutter, which can be adjusted to cut at ground level and up to 14 in. above the ground, and can mow swaths up to 7 ft wide. - J.W.F. [O.F.]

494. HANSEN, H.L., MILES, W.R., SMITH, M.E. and ANDERSON, P. (Inst. of Agric., Univ. Minnesota, Minneapolis, U.S.A.) Quack grass Amitrole, dalapon, diuron and simazine were tested over 2 successive years for control of quackgrass (Agropyron repens) and for possible harmful effects on trees in young Pinus resinosa plantations. Rates of application were 2.5, 5 or 10 lb a.i. in 100 gal water. Seedlings were shielded during spraying. A 1958 application of simazine at 5 lb gave residual control in 1959, and at 2.5 lb it was the most effective 1959 treatment. Amitrole proved the most effective treatment in 1958, but like dalapon, gave only temporary control in 1959 and damaged trees where spray drifted on to the needles. At 5 or 10 lb, diuron gave good control in both years, though it caused greatest mortality to seedlings. Simazine and diuron at 5 lb were effective against the following weeds: Poa palustris, Alopecurus pratensis, Cenchrus pauciflorus, Rosa spp., Fragaria virginiana, Senecio spp., Arenaria spp., Solidago graminifolia, Artemisia spp., Selaginella rupestris, and Amaranthus albus. - J.W.F. [O.F.]

BIOLOGY OF WEEDS AND POISONING BY WEEDS

495. SCHUBERT, R. (Inst. Systematik u. Pflanzengeographie, Halle/Saale, Neuwerk 21, Germany). Zur Ökologie der Ackerunkräuter. [On the ecology of field weeds.] Proc. Weed Conf. zent. biol. Anstalt, Berlin, 1959, 1-7, (G. russ. e.), figs.3, bibl.5.
Plants and plant groups which may be used as indications of soil character and potentialities are described, and their changed behaviour under altered ecological conditions, e.g. by herbicides, is discussed. P.C. [O.W.]

496. STANIFORTH, D.W. (Iowa Agric. Exp. Sta., Ames, U.S.A.) Responses of corn hybrids to yellow foxtail competition. Weeds, 1961, 9, (1), 132-6.
The competitive efficiencies of 4 maize hybrids (AES 801, late; Ia 4376, adapted late; Ia 4570, adapted and Ia 4630, early) were compared during 2 years under conditions of heavy infestations of Setaria lutescens and where 0, 70 and 140 lb N/ac was applied. With no N, S. lutescens competition reduced yields of AES 801 (late) from 63.3 to 22.4 bushels/ac, with 70 lb N from 101.3 to 53.5 bushels and with 140 lb N from 125.5 to 100.3 bushels. With Ia 4630 (early) S. lutescens reduced its yields from 52.3 to 24.1 bushels/ac with no N, from 89.4 to 65.8 bushels with 70 lb N and from 120.1 to 113.4 bushels with 140 lb N. With no N, the yield reduction per 112 lb mature S. lutescens was highest for AES 801 with 4.6 bushels and lowest for Ia 4376 with 2.36 bushels; with 70 lb N/ac yield reductions ranged from 3 bushels for AES 801 to 1.58 bushels for Ia 4630 and with 140 lb N from 3.04 bushels for AES 801 to 0.61 bushels for Ia 4630. Dry matter yields of mature S. lutescens (above ground parts) in these trials ranged from 950 to 1880 lb. The importance of maize hybrid adaptation and maturity range as a factor to be reckoned with in maize/weed ecological studies is emphasised. - P.J.B. [O.W.]

497. KNAKE, E. (Illinois Agric. Exp. Sta., Urbana, U.S.A.) Giant foxtail, a robber in your fields. Ill. Res. 1960, 2, (3), 3-4, figs.7, tabs.2.
In trials during 1957-59 in Illinois on Drummer silty clay loam, maize and soybeans were grown on plots with populations of Setaria viridis ranging from light (2 per ft of row) to heavy (50 per ft of row). Grain yields of maize averaged 70.6 bushels/ac on the most and 90.4 on the least heavily infested plots and 93.5 bushels on weed-free controls; respective soybean yields were 27.6, 37.1 and 38.5 bushels/ac. Percentage yield reductions for different S. viridis populations are given as a guide to estimating the profitability of different weed control measures. - P.J.B. [30(77.3)]

498. ASPINALL, D. (Waite Agric. Res. Inst., Univ. Adelaide, Australia). An analysis of competition between barley and white persicaria. II. Factors determining the course of competition. Ann. appl. Biol., 1960, 48, (3), 637-54, figs.7, tabs.4, bibl.21.
Polygonum lapathifolium grown with barley had a lower relative growth rate, lower net assimilation rate, higher leaf-area ratio and a higher leaf-area:leaf-weight

ratio than when grown alone. These differences were accentuated with time and with increase in the density of the surrounding barley plants. It was confirmed that these responses were those of plants subjected to a high degree of shading. However, root competition appeared to reduce growth more than shoot competition (although the influence of the latter increased with time) and an increase in nutrient supply increased growth of P. lapathifolium proportionately more than that of barley in a mixed population. These results suggest that restricted nutrient supply was the factor which first decreased growth of P. lapathifolium - a direct consequence of its smaller root system arising from a smaller embryo. The divergence in growth led with time to P. lapathifolium becoming progressively more and more shaded and ultimately caused a further reduction in root and leaf expansion.

The reduction in tiller number, but not in dry weight, of barley when grown with P. lapathifolium was interpreted as a response to a lower internal concentration of nitrogen arising directly from the lower external concentration. Root extension did not appear to be significantly reduced. - From Author's Summary (modified). D.M.L.S. [O.W.]

499. ARAI, M. and KATAOKA, T. (Kanto-Tosan Agric.Exp.Sta., Japan). [Mechanism of competition between barley and weeds in winter cropping on drained paddy fields and a diagnosis method of the weed damage.] Proc.Crop Sci.Soc.Japan, 1960, 29, (1), 133-6, figs.3, tabs.3, bibl.6.

Experiments under various cultural and weed conditions showed that competition between barley (or wheat) plants and weeds (mainly Alopecurus aequalis) became serious from about the onset of internode elongation in the crop, but was stabilized after heading.

The final productive relations in the crop/weed community changed almost proportionally to the increase in weed density, i.e. the graph of weed production increase was very slightly curved, while barley (or wheat) production decreased in an almost perfectly linear manner in proportion to the increase in weed density. The decrease in crop production was greater than the increase in weed production and therefore total production of the community also decreased slightly for higher weed densities. The ratio of barley (or wheat) plants to total production declined linearly as the weed density increased. Yield decrease of barley (or wheat) caused by weeds was closely related, first to the reduction in the ratio of weeds to total production and secondly to the decrease in total production, but showed little relation to reduction in the ratio of grain weight to total plant weight. These competitive relations differed with cultural conditions, such as sowing rate, fertiliser amount, row spacing and species of crop and weed; these differences had a clear effect on the ratio of weeds to total production. - From Authors' Summary (modified). - D.M.L.S. [100(52)]

500. HARPER, J.L. and CHANCELLOR, A.P. (Dep.Agric.Bot., Univ.Coll.N.Wales, Bangor, Caerns., Wales). The comparative biology of closely related species living in the same area. 4. Rumex: Interference between individuals in populations of one and two species. J.Ecol., 1959, 47, 679-95, figs.10, tabs.6, bibl.6.

Species used were: Rumex obtusifolius, R. crispus, R. conglomeratus, R. sanguineus, and R. hydrolapathum. Pot experiments were conducted to study the nature of the interference between these species when grown under controlled conditions of sowing density, species mixtures, water regime and soil type. The reaction of R. crispus and R. obtusifolius to Lolium perenne was also studied. Where one species of Rumex was sown per pot, there were no significant differences between the numbers of plants of each species surviving to harvest. Except for R. sanguineus, the pattern of response to water table was similar for all species. The highest number of plants per pot remained in those where the water table was maintained at a depth of 10 cm. R. sanguineus established the greatest number of plants under freely drained conditions. Total dry weights per pot in every case were produced in freely drained pots. R. obtusifolius and R. hydrolapathum did not flower during the season in which they were sown. R. sanguineus flowered only under freely drained conditions, while R. crispus flowered under all water regimes (water table at surface, 10 cm deep, and freely drained). R. obtusifolius showed a considerable capacity to inhibit flowering in the other Rumex spp. Where Lolium perenne was sown at the same time, very few plants of R. crispus or R. obtusifolius persisted to harvest. There was no evidence that response to water table and soil in these pot experiments was particularly associated with their distribution under natural conditions.

R. crispus showed better capacity than R. obtusifolius to multiply in unstable arable field habitats owing to its ability to set seed in its first year of growth and its tolerance of different water regimes. - P.J.B. [427(42)]

501. RAMAKRISHNAN, P.S. (Dep.Bot., Banaras Hindu Univ., Varanasi, India). Ecology of Echinochloa colonum Link. Proc. Indian Acad. Sci., B., 1960, 52, (3), 73-90, figs.2, tabs.11, bibl.41.
Includes records of investigations into the effect of various soils and habitats on growth, seed germination after periods of storage, reproductive capacity, and the osmotic pressure of the plant sap. - D.M.L.S. [O.R.]

502. SAGAR, G.R. and HARPER, J.L. (Dep. Agric.Bot., Univ.Coll.N.Wales, Bangor, Caerns, Wales). Factors affecting the germination and early establishment of plantains (Plantago lanceolata, P. media and P. major). Biology of Weeds, Symp.Brit.ecol.Soc., 1960, 236-45, figs.4, tabs.2, bibl.3.
Field and laboratory studies showed that P. major and P. media are light sensitive in their germination and when first harvested require a pre-treatment of up to 14 days at 5°C before germination will proceed at 15°C. P. lanceolata has less rigid requirements; it showed a higher % germination on soil than in standard tests on filter pads or vermiculite. When seeds of the 3 species were sown in various natural and agricultural habitats and when seedlings also were transplanted into the same habitats, it was apparent that the phases of germination and early seedling life were critical for the establishment of a species. Only rarely was it possible either to introduce a species into a habitat or to increase its density by sowing seeds. - Authors' Summary (modified). - D.M.L.S. [O.W.]

503. EDWARDS, M.M. (Nottingham Univ., Sch. Agric., Sutton Bonington, England). The germination of charlock seeds. Rep.Univ.Nott., Sch.Agric. 1958, 1959, 36-8, bibl.2.
The average number of seeds of Sinapis arvensis germinating in the autumn and spring following their production does not exceed 3%. After over-wintering for 2 or 3 years, the percentage rises to ca. 80%. The dormant state is regarded as a function of the oxygen tension in the seed. In order to evaluate its importance, excised embryos were placed in Warburg vessels containing different mixtures of oxygen and nitrogen, ranging from 100% oxygen to zero. The excised embryos grew in concentrations of 5% O_2, but whole seeds did not. From this it was concluded that with an internal partial pressure of O_2 less than 10-12%, inhibiting substances are produced which leach slowly out of the seed through the testa. When the partial pressure of O_2 at the centre of the seed reaches 12%, anaerobic metabolism ceases and germination takes place. Oxygen intake is determined by the depth at which the seed is placed in the soil. - P.C. [O.W.]

504. FULWIDER, J.R. and ENGEL, R.E. (Rutgers Univ., New Brunswick, New Jersey, U.S.A.) Seed characteristics and control of goose grass, Eleusine indica. U.S.Golf Ass.J., 1960, 12, (7), 24-7.
Seeds of E. indica stored for 6 months gave over 90% germination at 20°C for 16 hours a day and 35°C for 8 hours a day, or in daylight alone at constant temperatures. Germination was poor in darkness at 30°C, and moderate at alternating temperatures of 20° and 30°C. Chlordane [1,2,4,5,6,7,8,8-octachloro-4,7-methano-3a,4,7,7a-tetrahydroindane] at 60 % + clay [formulation not stated] was the best of 6 herbicides applied before seedling emergence to control E. indica and Poa pratensis/Agrostis spp. turf, and caused no damage to the turf grasses. Applications in mid-April were the most effective. Disodium methylarsonate, with or without 2,4-D [rates of application not stated] applied in September gave, respectively, 63 and 73% control of E. indica plants, and reduced viable seed set by 90% - From Herb. Abstr., 30, (4), 1684. - P.C.

505. HOCOMBE, S.D. (Col.Pest.Res.Unit, Arusha, Tanganyika). Simple experiments on the greenhouse germination of some East African weed species. Misc.Rep.Colon. Pest.Res.Unit, Arusha, (n.d.), 285, pp.8, bibl.2.
Seed of 18 weed species collected locally at Arusha at 1-12 weeks after harvest were subjected to pre-soaking (tap water for 1 hour), washing (for 3 days), pre-chilling (35°F for 3 days), temperature alternation (19 hours at 35°F, 5 hours at 90°F, for 5 days) and scarification in H_2SO_4 for 15 minutes before being sown in soil in boxes. Other samples were sown on the soil surface. Only Bidens pilosa, Chenopodium album, Crotalaria sp., Datura stramonium and Leonotis mollissima were capable of

immediate germination without treatment. Seed of Erigeron bonariensis, Portulaca oleracea, Sonchus oleraceus and Tagetes minuta all had >62% germination when sown on the soil surface and appeared to have a definite requirement for light. Nicandra physaloides germinated to an appreciable extent only after acid scarification. Leonotis mollissima, alone, appeared to show increased germination after pre-chilling. Bidens pilosa seed appeared to enter a dormant phase which was almost fully developed 8 weeks after shedding. - P.J.B. [9(678)]

506. ARAI, M. amd MIYAHARA, M. (Kanto-Tosan Agric.Exp.Sta., Japan). [Physiological and ecological studies on barnyard grass (Echinochloa crus galli Beauv. var. oryzicola Ohwi). I. On the primary dormancy of the seed. (1) Relation of the seed covering to dormancy, and effects of temperature and oxygen on breaking dormancy.] Proc.Crop Sci.Soc.Japan, 1960, 29,(1),130-2, figs.4,tabs.1,bibl.8.

The results of these studies indicated that primary dormancy was due to the presence of the pericarp and epidermis and not of the shell coat, and it was suggested that delayed germination of the dormant seed might not be associated with impermeability of the seed coat to water. High temperature treatment (40-50°C) effectively overcame dormancy, and moist conditions at 5°C were also effective in accelerating the process of after-ripening though not at 20° and 30°C. Neither highly dormant nor non-dormant seeds showed any response to alternating temperatures; however, the dormancy of partially dormant seeds was overcome by this treatment, its effectiveness being attributed to the low temperature used as well as to alternation of temperature. Freezing (-5°C) was effective in overcoming dormancy only in partially dormant seeds.

Seeds processed to a certain degree of dormancy through air-dry storage were subjected to both freezing and storage in submerged soils. Storage at 5°C promoted the breaking of dormancy, but storage at the optimum temperature for germination induced deeper dormancy. Storage in nitrogen (without oxygen) accelerated the breaking of dormancy; this acceleration was more noticeable in partially dormant seeds, and the breaking of dormancy was more rapid at 30°C than at 5°C. From Authors' Summary (modified).-D.M.L.S. [99(52)]

507. PODOPRIGORA, P.S. (All Union Sci.Res. Inst.Maize, Dneprofetrovsk). Viability of seeds of late spring weeds in water. Ukrainian Bot.J., 1959, 16,(6),23-9, (Russ.e.), bibl.6.

An experimental study of the effect of submersion in water on the viability of seed of some Ukrainian late spring weeds is reported. Submersion was from 22 days to 13 months. Seeds of Echinochloa crus galli, Setaria viridis, S. glauca, Chenopodium album and Amaranthus albus, retained viability for more than 13 months, although their germinating capacity was reduced, varying from 3% (E. crus galli) to 27% (C. album). Seeds of Salsola ruthenica lost their germinating capacity after 22 days in water. - From Field Crop Abstr., 13,(4),1971. - P.C.

508. KNIGHT, R.J. (Jnr.) Compatibility relations in the Convolvulaceae. Proc.9th internat.Bot.Congr., Montreal, 1959, 159.

In studies of seed set after selfing, self compatibility has been found in 15 species and self incompatibility in 9. Intraspecific cross compatibility has been determined in some species. - From Plant Breed.Abstr., 30,(4),3594. - D.M.L.S.

509. DASANAYAKE, M.D. (Dep.Bot., Univ.Ceylon, Colombo 3, Ceylon). Aspects of morphogenesis in a dorsiventral fern, Pteridium aquilinum (L.) Kuhn. Ann.Bot., London, 1960, 24,(95), 317-29, figs.22,bibl.29.

The formation of the horizontal dorsiventral rhizome of P. aquilinum from the erect radial axis of the young sporeling is described. Study of the shoot apex and the inception of leaves and buds at the apical meristem has shown that inception is essentially similar in long and short shoots, later differences being due to differing rates of growth and internodal elongation. - Author's Abstract (modified). - D.M.L.S. [O.RE.]

510. REED, C.F. Myrica pensylvanica, a new host for Phoradendron flavescens in Virginia. Castanea, 1960, 25,(2),86.

In addition to Myrica pensylvanica, the following genera have been reported as hosts for Phoradendron flavescens: Acer, Aesculus, Betula, Carya, Celtis, Diospyros, Fraxinus, Gleditsia, Hamamelis, Juglans, Liquidambar, Maclura, Nyssa, Platanus, Populus, Prunus, Pyrus, Quercus, Robinia, Tilia and Ulmus. - J.W.F. [O.F.]

511. SUBRAMANIAN, C.L. and SRINIVASAN, A.R. (Agric.Coll. & Res.Inst.,Coimbator,Madras State,India). A review of literature on the phanerogamous parasites. Monogr.Indian Coun. Agric.Res., 1960, 10-24, pp.96.
This is a comprehensive review of the world literature on the phanerogamous parasitic plants. The different genera are dealt with individually and lines of investigation on these plants worthy of study in the future are indicated. - P.J.B. [O.W.]

512. LEWANDOWSKI, L. and KUTROWSKI, W. Zatrucie jalowek starcem jakubkiem (Senecio jacobaea L.). [S. jacobaea poisoning in heifers.] Med.Wet.Warszawa, 1959, 15,518, (Polish).
An account of an outbreak in which 12 yearling heifers were affected, some fatally, after feeding for a few days on a new consignment of hay. The symptoms are described. About 5% of S. jacobaea was found in the hay. From Vet.Bull.,Weybridge, 30,(6),341. - D.M.L.S.

AQUATIC AND WOODY WEEDS AND THEIR CONTROL

513. CHANCELLOR, R.J. (A.R.C.Weed Res.Org., Begbroke Hill,Kidlington,Oxford.) Chemical control of water weeds. Agriculture, 1961, 67,(10),507-10, bibl.8.
Dalapon is the most satisfactory chemical available for use on emergent weeds, the only common emergent weeds that are resistant being Lythrum salicaria and Rumex hydrolapathum. Amitrole may be used, but is less selective.
Pelletted 2,4-D is used for controlling submerged weeds, and in addition acrolein, copper sulphate, monuron and simazine have limited uses, particularly in static water.- J.W.F. [O.W.]

514. MATTHEWS, L.J. (New Zealand Dep.Agric., Wellington,New Zealand). Aquatic weed control. Proc.13th N.Z.Weed Control Conf., 1960, 58-61.
The results are given of preliminary trials with herbicides for controlling submerged and floating aquatic weeds. Chlorinated aromatics have been tested extensively but have not been popular with users owing to their ineffectiveness, high cost and disagreeableness. The duckweeds Callitriche verna and Azolla filiculoides var. rubra have been controlled by surface-spraying with these materials. In trials in large areas of water in which herbicidal concentrations of 5, 10 and 25 p.p.m. were maintained in the first ac/ft, 2,4,5-TP was superior to fenac and 2,4-D against Lagarosiphon major and Elodea canadensis. 2,4,5-TP liquid at 12 p.p.m. gave 80-90% kill of both these species, whereas 2,4,5-TP granules had no effect. Trout were unaffected by 2,4,5-TP at 50 p.p.m. A. filiculoides var. rubra has been killed by 4 lb PCP in 20-40 gal/ac. - P.J.B. [O.W.]

515. UNITED STATES, AGRICULTURAL CHEMICALS. Aquathol aquatic herbicides now available commercially. Agric.Chemic., 1961, 16,(4),23, figs.2.
Aquathol [disodium endothal] which is now being produced by Pennsalt Chemicals Corp. in both liquid and granular formulations is briefly discussed. For details see Weed Abstr., 10, 582. - J.W.F. [O.W.]

516. KRAMER, D. and MANZKE, E. (Inst. Wasserwirtsch.,Berlin,E. Germany). Wirkungsvergleich zwischen den Herbiziden Selest und Tributon. [Comparison of the effect of the herbicides Selest and Tributon.] Dtsch.Landw.,Berlin, 1961, 12,(1),25-8, tabs.3,bibl.7.
Trials were carried out in 1957-58 to determine the relative efficacy of Selest and Tributon (both 2,4-D + 2,4,5-T mixtures) as herbicides for use on the banks of irrigation and drainage channels. Both mixtures were applied at a rate of 0.67 ml/m^2 in 0.8 l/m^2 water, and showed no significant difference in herbicidal activity. Dicotyledenous weeds showed a dry matter weight reduction of ca. 50% on irrigation ditches and 30-40% on drainage ditches. Monocotyledonous weeds, especially Agropyron repens, increased rapidly after the destruction of dicotyledonous weeds. P.C. [O.W.]

517. DINGWALL, A.R., RICHARDS, J.G. and SCHOFIELD, R.C. (N.Z.Dep.Agric.,Wellington, New Zealand). The control of sweet brier. Proc.13th N.Z.Weed Control Conf., 1960, 23-8, bibl.7.
Aspects of the biology and control of sweet brier (Rosa rubiginosa) reviewed include seed dormancy and viability, the effect of browsing, cutting, burning and mechanical grubbing, the possibilities of biological control, and the use of overall and basal herbicidal sprays. Recommendations for

control are given. The only herbicides which have shown promise against sweet brier are 2,4,5-T, 2,4,5-TP, fenuron, monuron and, to a lesser extent, 2,3,6-TBA. - P.J.B. [O.W.]

518. KLUG, H.A. and HANSEN, H.L. Relative effectiveness of various concentrations of 2,4-D in basal, dormant season applications to hazel brush. Minn.For. Note, 1960, No. 94, pp.2, bibl.2.
Concentrations of 0.5, 1, 1.5, 5, 10 and 15 lb 2,4-D a.e. in 100 gal fuel oil were applied by brush to the bases of 30 hazel stems. Effects on the two species present, Corylus cornuta and C. americana, differed. Treatments at all concentrations on C. cornuta were effective, and caused 76-100% mortality Mortality of C. americana was similar for concentrations of 5-15 lb. For both species, a rate of 5 lb a.e. was established as effective for securing a good kill. - From For. Abstr., 22,696. - P.C.

519. JOUBERT, J.G.V. Bush encroachment a serious problem in South-West Africa. Farming S.Afr., 1960, 36,(4),20.22.
The following methods of controlling bush encroachment are mentioned briefly: veld burning, aerial spraying, stem spraying with 2,4,5-T + diesoline, goats used to strip the bark of bushes, and chopping or sawing the bushes off at a low level. - J.W.F. [C.A.]

520. POND, F.W. and CABLE, D.R. (Rocky Mountain For. & Range Exp.Sta.,Tempe, Arizona,U.S.A.) Effect of heat treatment on sprout production of some shrubs of the chaparral in Central Arizona. J.Range Mgmt, 1960, 13,(6),313-17, figs. 2,tabs.2,bibl.7.
Chaparral plots were burned with a torch generating 1500°F, applied near ground level until the wood glowed. Live oak [Quercus turbinella] required 4-5 annual treatments for control. Results with Skunkbrush sumac [Rhus trilobata] were erratic, and no firm conclusions could be drawn as to the value of the method. Wright's silktassel [Garrya wrightii], hollyleaf buckthorn [Rhamnus crocea], desert ceanothus [Ceanothus greggii], and point-leaved manzanita [Arctostaphylos pungens] were all controlled by two burns applied either annually or both in the same year. On a range scale, however, the reduction by burning of less desirable species appeared impracticable. - P.C. [O.W.]

521. DAY, M.W. (Dunbar For.Exp.Sta., Michigan,U.S.A.) Control of red maple stump sprouts. Quart.Bull.Mich.agric.Exp.Sta., 1960, 43,(2),287-91.
Several herbicides were tested for preventing sprouting from recently-cut red maple stumps, and for killing established sprouts on older stumps. 2,4,5-T (esters), when used in oil solution at 12 lb and 16 lb/100 gal, were completely effective when applied to both freshly-cut stumps, and old stumps with established sprouts. Water solutions were not as effective as the oil solutions, but on new stumps, products containing polychlorinated benzoic acid (1), 2,4,5-T (triethylamine salt) (2) and 2,4,5-T (propylene glycol butyl ether ester) (3) gave promise of having considerable value, (2) giving the best results. Treatments of the older stumps showed similar results, except for some differences among the range of different sized sprouts on the older stumps. - From Author's Summary. - J.W.F. [O.RE.]

522. WIANT, H.V. and WALKER, L.C. (Georgia Agric.Exp.Sta.,Athens,U.S.A.) Effectiveness of a mechanical tree girdler. Ga agric.Res., 1960, 1,(4),7,figs.1.
Results are given of assessments of the control of a number of hardwood species 3 years after girdling with a mechanical tree girdler. All species, except Nyssa sylvatica, were girdled once at about 3.5 ft above ground level; N. sylvatica was girdled twice. Carya spp. were girdled with axes and all trees ranged from 6-9 in. d.b.h. With all Quercus spp., top-kill averaged 94% with 47% killed with no resprouting. Top-kill of Carya spp., N. sylvatica, Acer rubrum and Oxydendrum arboreum ranged from 17 to 42%, with 0-7% killed with no resprouting. With the last 3 species, mechanical girdling was considered of doubtful value. - P.J.B. [14(75.8)]

523. KREFTING, L.W., HANSEN, H.L. and HUNT, R.W. Improving the browse supply for deer with aerial applications of 2,4-D. Minn.For.Note, 1960, No. 95, pp.2.
2,4-D ethyl ester at 2 lb a.e./ac in 3.5 gal water was applied from the air to 2-ac plots of (a) Populus sp., (b) Quercus sp., (c) Pinus banksiana and (d) upland brush. After 1 year, stem numbers of desirable

browse species increased from 24 to 182%. No mortality of herbage plants was noted, and grass and sedge density increased as the amount of light reaching the ground increased. Cost was about $4.0 per ac. - From For.Abstr., 22,683. - P.C.

524. PEEVY, F.A. (Agric.Res.Serv.,U.S.D.A.) Soil application of chemicals for control of Southern upland hardwoods. Forests & People, Alexandria,La, 1960, 10,(1),24-5,37, figs.2, tabs.1,bibl.2.

Both fenuron and monuron were effective in killing blackjack [Quercus marylandica] and post oaks [Q. stellata] when applied at 0.5-1 g of active material (finely ground powder or pellets)/in. of trunk diameter; applications were made in late winter or spring as soil injection or broadcast treatments. Fenuron was more effective than monuron and its residue seemed less damaging to pines after 2 growing seasons.

2,4,5-T 0.5 g/in. of trunk diameter, was more effective when applied as a basal stem treatment to the lower 16 in. of the stem than when injected into the soil. - J.W.F. [O.F.]

525. MERRIFIELD, R.G. and HANSBROUGH, T. (N.Louisiana Hill Fm Exp.Sta.,Homer,U.S.A.) Substituted urea herbicides in the control of undesirable hardwoods. Weeds, 1961, 9,(1), 85-9, tabs.1,bibl.15.

The trials reported were carried out during 2 years on typical oak/hickory sites in N. Louisiana on loamy fine sands containing approximately 2.2% organic matter. In 1955, monuron, diuron and fenuron were applied as ground sprays at rates of 4, 8 and 12 # in strips 1 ft wide at intervals of 6 ft (rates on strips approximately 7 times the per ac rate). In 1956, pelletted monuron, diuron and fenuron at 4, 8 and 12 # were broadcast and fenuron wettable powder at 10 # was sprayed overall. As assessed in June, 1957, it was evident that, except for fenuron pellets at 12 #, no treatment had more than negligible herbicidal effects. Pelleted fenuron at 12 # gave approximately 75% kill, but cost about $57/ac. Decomposition of the herbicides by soil micro-organisms and the method of application, but not leaching, were thought to be factors which reduced herbicidal effectiveness. - P.J.B. [O.W.]

526. BRINKMAN, K.A. (Cent.States For.Exp. Sta.,Columbia,Missouri,U.S.A.) Controlling oaks with stem-applied herbicides. Iowa State Coll.J.Sci., 1960, 34,(4),613-22, tabs.5,bibl.4.

This is a comprehensive report on a study of the effects of (1) 2,4,5-T 12.5 and 50 lb/100 gal fuel oil in a low frill (6 in.) and as a basal spray, (2) AMS 4 lb/gal water in both low and high (30 in.) frills, and (3) monuron 0.4 and 1.6 lb/gal water in low frills, all applied in February (late dormant season), June and November (early dormant) to Quercus alba, Q. marylandica, Q. velutina and Q. stellata. The effects were examined at the end of each summer for 4 years.. The results are fully tabulated and costs given and discussed. Except on Q. alba, the June monuron 1.6 lb/gal treatment was more effective than any other; 0.4 lb/gal was unsatisfactory. With 2,4,5-T, the June 50 lb a.h.g. treatment killed more than 80% of all treated trees, but February applications killed very few of any species; when applied in November 12.5 lb was as effective against Q. alba as monuron applied in June and was more effective than 50 lb against Q. stellata. Basal sprays with 2,4,5-T were ineffective at the lower rate and at the higher were successful only on Q. marylandica, 80-90% of which were killed by dormant season application. AMS was more effective against Q. alba and Q. stellata when applied in the dormant season and against Q. marylandica and Q. velutina when applied in June; high frill treatment with AMS was less effective than low against all but Q. stellata, which appeared little affected by the height of frill. - D.M.L.S. [21(77.8)]

527. PEEVY, F.A. (Southern For.Exp.Sta., Alexandria,Louisiana,U.S.A.) Control of blackjack oak by basal spraying with 2,4,5-T. Weeds, 1961, 9,(1),50-3, figs.1, tabs.1,bibl.7.

2,4,5-T propylene glycol butyl ether ester in a concentration of 8 lb/100 gal diesel oil was applied to bands 8, 12 and 16 in. wide to trunks of blackjack oak (Quercus marylandica) in volumes of 16, 32 and 64 ml/in. of stem diameter in April, July, October or February for 2 consecutive years. As a standard treatment, 16 lb 2,4,5-T /100 gal oil was applied in a band 16 in. wide. 2,4,5-T at 8 lb/100 gal and 16 ml per in.diameter was ineffective at all band widths. A rate of 64 ml/in. diameter gave the best kill; with the 8-, 12- and 16-in. band widths, respective kills were 84, 77 and 75% for all treatment dates. Best kills were secured by treatments in February, followed by April; results with sprays in July and October were poorer, but with sufficiently high volume rates, control was good for all dates of treatment. - P.J.B. [O.W.]

528. OTTER, F.L. Timber stand improvement by poisoning black oak on Mountain Home state forest. St.For.Note Calif.Div. For., 1960, No. 2, pp. 4, bibl.4.
In tests on over-growth of black oak (Quercus kelloggii) to release conifer saplings, axe cuts were made into the stems the same distance apart as the width of the cut, and filled with liquid 2,4-D amine at 4 lb a.e./gal. Treatment was uniformly successful. - From For. Abstr., 22,692. - P.C.

529. KISPATIC, J. and BOHM, A. (Fac. Agric.& For.,Zagreb,Yugoslavia). Mogucnosti primjene herbicida u sumarstvu. [On the use of herbicides in forestry.] Sumarskog Lista,Zagreb, 1960, 84,(5-6), 137-51, figs.3,bibl.7.
Uses of herbicides are listed, with the conclusion that they are often cheaper and more effective than mechanical methods of removing unwanted growth. 2.4,5-T 40% in diesel oil was applied in a broad band, 10-11 in. wide, 4 ft from the ground, to the trunks of saplings 1-2 in. in diameter; death followed in 3-5 weeks. - From Authors' Summary. - P.C. [68(497.1)]

530. CRUZADO, H.J., MUZIK, T.J. and KENNARD, W.C. (Federal Exp.Sta.,Mayaguez, Puerto Rico). Control of bamboo in Puerto Rico by herbicides. Weeds, 1961, 9,(1), 20-6, figs.1,tabs.3,bibl.7.
Of 20 herbicides tested against bamboo, TCA, dalapon, monuron and amitrole showed most promise. In the trials reported, these herbicides were applied as: (a) basal applications to intact culms, (b) basal applications to cut stumps and (c) foliage sprays. Treatments (a) and (b) were applied as solutions at a rate of 2 gal/50 culms and (c) until the foliage was thoroughly wet. Where applications were made to intact culms, the thin-culm species Phyllostachys meyeri was treated with 0.8 lb a.i./50 culms and the other species, Bambusa arundinacea, B. multiplex, B. textilis, B. tulda, B. vulgaris, Dendrocalamus asper, D. membranaceus, D. strictus, Gigantochloa apus, Phyllostachys bambusoides and Sinocalamus oldhami, with 1.6 lb a.i./50 culms. At 9 months after treatment monuron gave the best control and killed 10 out of 20 clumps. Phyllostachys bambusoides and B. vulgaris were the most resistant, while B. tulda, G. apus and B. textilis were completely killed. At 24 months after treatment, monuron eradicated B. tulda, B. textilis, G. apus, D. asper, D. strictus and P. meyeri. Dalapon also at the 1.6 lb rate eradicated B. textilis, D. asper and D. strictus and was the most promising herbicide for eradicating B. vulgaris. Applications of TCA and monuron applied to cut stumps were effective. Where sprays were applied to the foliage of culms cut and allowed to regrow to a height of 6-8 ft, D. strictus and S. oldhami were the most susceptible to TCA, dalapon and amitrole as 6% a.i. sprays (+ 0.05% Tween 20). Combinations of dalapon (6%) + amitrole (3%) applied as foliage sprays to wet the leaves and stems to run-off gave complete control of B. vulgaris when cut and allowed to start regrowth before treatment. - P.J.B. [O.W.]

OTHER WEEDS AND THEIR CONTROL

See also 432,433,452.

531. SELLECK, G.W. (Plant Ecol.Dep.,Univ. Saskatchewan,Saskatoon,Canada). Recent advances in the chemical control of wild oats. Weeds, 1961, 9,(1),60-71, figs.2,tabs.7, bibl.18.
Results of trials with CDAA, 1,2,4,5-tetrachlorobenzene, EPTC, simazine, di-allate and barban in Saskatchewan since 1955 are reviewed in some detail. Those showing most promise were di-allate, EPTC and barban. Of these, di-allate has given the most consistent results and, at 1.5 #, has controlled wild oats successfully in flax, oil-seed rape and barley. It has performed successfully on stubble and summer-fallow land, in soils ranging from loam to silty clay loam, in seedbeds which were dry, moist or wet at the time of sowing and in dry and moist growth seasons. Crop injury did not appear to be increased by reducing the delay between applying di-allate and sowing from 3 weeks to 2 hours. A single discing appeared adequate for incorporation on summer-fallow, but 2 were necessary on stubble land. With barban, soil moisture was an important factor in its effectiveness. Applications just before or in the very early stages of crown root development of wild oats, appeared to be most effective and this herbicide showed promise for controlling wild oats in wheat, barley and oil-seed rape. CDAA varied widely in effectiveness; EPTC applied in spring was fairly consistent in its effect on wild oats, but, except with flax, was inconsistent in selectivity. - P.J.B. [O.W.

532. UNITED STATES, COLORADO FARM AND HOME RESEARCH. New hope for control of wild oats. Colo.Fm Home Res., 1961, 11, (4),9.
In limited trials during the 1960 season in Colorado, 2,3-dichloroallyl diisopropylthiolcarbamate [di-allate] 1.5-3 # gave good control of wild oats in sugar beet and very good control of Setaria spp. Results against broad-leaved species were fairly good and there was no injury to the crop. Barban applied to wild oats at the 2-leaf stage gave good results; a rate of 0.5 # caused no crop injury, but 1 # reduced the gross sucrose yield by 0.5 ton/ac. Results in 1960 with EPTC were good, but crop injury has been noted in previous seasons. - P.J.B. [47(78.8)]

533. RADEMACHER, B. (Inst.Pflanzenschutz., Stuttgart-Hohenheim,Germany). Aussichten auf Bekämpfung des Ackerfuchsschwanzes in den Winterungen. [Views on the control of blackgrass (Alopecurus myosuroides) in winter.] Mitt.dtsch.LandwGes., 1959, (36), pp.3, tabs.5.
Experiments conducted from 1955-57 showed that early cultivation followed by delayed sowing of wheat can by itself reduce infestation with blackgrass by about 65%. Calcium cyanamide was effective in autumn, when active growth takes place, in doses of 200-300 kg/ha, TCA 2.5-5 and dalapon 1.6-2.5 kg/ha both gave adequate control, but damaged the wheat, unless applied 3 weeks before sowing. TCA at 5 kg/ha damaged the wheat, as did simazine.
As winter rape is dicotyledonous, dalapon and TCA may be applied either pre- or post-em. for control of blackgrass in this crop; both are effective at 2 kg/ha in 600 l/ha water. - P.C. [255(43)]

534. MERRY, D.M.E. (Dep.Agric.,Pukekohe, New Zealand). Control of barley grass. N.Z.J.Agric., 1960, 101,(2),119.
Research and recent trials have shown that little, if any, seed of Hordeum murinum remains viable in the ground for more than 1 season and that late winter, before the spring growth begins, is the best time to spray. Close grazing by sheep before spraying in early September with dalapon 2 #, followed by 1.5 # 6 weeks later, almost eliminated it. Close grazing or mowing before spraying is considered essential. - D.M.L.S. [O.RE.]

535. NEWMAN, D.A. (Dep.Agric.,Dargaville, New Zealand). The eradication and replacement of ratstail. Proc.13th N.Z.Weed Control Conf., 1960, 112-6.
The results are presented of trials with dalapon or dalapon + amitrole for the control of infestations of ratstail (Sporobolus capensis) in pastures. From the results, the following recommendations were made: (a) top-dress adequately, (b) apply dalapon 2.5-3 # in 15-20 gal water, (c) top-dress and sow area within a fortnight after spraying, (d) graze reseeded pasture to encourage rapid establishment and cover. - P.J.B. [O.W.]

536. BLACKLOW, W.M. (Dep.Agric.,Hobart, Tasmania). Serrated tussock in Tasmania. Proc.2nd Aust.Weeds Conf., 1960, Pap. 63, pp.3, bibl.3.
A short account of measures taken in Tasmania to eradicate Nassella trichotoma from the South Arm Peninsula to which it is confined. Cultivation and TCA are the means used. It has been found best, where possible, to crop the area the first year and sow down to pasture in the second year. Fertilisation of the sown pasture is essential. - D.M.L.S. [O.W.]

537. YOUNG, H.E. (Bur.Sugar Exp.Sta., 99 Gregory Terrace,Brisbane,Queensland, Australia). Chemical control of Sorghum halepense in North Queensland. Proc.2nd Aust.Weeds Conf., 1960, Pap. 40, pp.4.
The following treatments gave complete control without regrowth:- (1) 5 treatments with dalapon (as Dowpon) 4.25 # beginning on 30th November with weekly intervals between treatments; (2) dalapon 4.25 and 8.5 # + in each case TCA 10 #. Four applications of dalapon at 4.25 # with intervals of 3 weeks gave nearly 100% control and was as good as 4 applications of 8.5 # applied similarly and better than 4 applications of 4.25 # at weekly intervals. The following dalapon treatments were unsatisfactory, particularly in failing to kill the rhizomes: (1) 8.5-34 # as single applications in November under very dry conditions when grass was ca. 6 in. high and after rains when grass was lush and about 24 in. high; (2) 2 and 3 applications of 8.5, 12.75 and 17 # respectively; (3) 8.5 # on November 12th followed on November 30th by (a) 2.55 # +

TCA 10 #, (b) 5.1 # + TCA 20 #, and (c) 7.65 # + TCA 30 #. Sugar cane in treatment 3 (a) was slightly checked and in 3 (b) and (c) checked and injured, and crops in all 3 cases were markedly inferior to untreated controls. Pre-em. control of grass seedlings was good with dalapon 30 and 40 #, fair with 20 # and poor with 10 #. - D.M.L.S. [O.W.]

538. BOOTH, A.K. (Dep.Agric.,Wanganui, New Zealand). Weed identification and control. Pennisetum macrourum. N.Z.J. Agric., 1960, 101,(4),337-9, figs.5.
P. macrourum and its growth habits are described and its potentiality as a serious weed discussed. Infestations in New Zealand are listed. None of the following treatments (applied in at least 200 gal water/ac) gave good results: (a) on established plants - monuron 10 + amitrole 2 #, monuron 20 + amitrole 4 #, monuron 30 + amitrole 6 #, dalapon 15 + amitrole 3 #, dalapon 30 + amitrole 6 #, dalapon 30 #, fenac 12 #; (b) on 8-month old seedlings - dalapon 10 + amitrole 2 #, dalapon 20 + amitrole 4 #, monuron 10 + amitrole 2 #. Experimental work indicates that it can be killed by monuron 85 + amitrole 15 # in 600 gal water applied in the autumn. Any regrowth should be sprayed the following spring. - D.M.L.S. [O.RE.]

539. ALLEN, F.C. The control of cutty grass (Carex spp.). Proc.13th N.Z.Weed Control Conf., 1960, 34-8, figs.1,bibl.6.
The biology of the so-called cutty grasses is discussed briefly. In trials in 1959, the following herbicides were applied with a logarithmic sprayer to determine their optimum rates for successful cutty grass control in pastures: mixed sodium and potassium salts of MCPA, MCPA butyl ester, MCPB sodium salt, 2,4-D butyl ester, 2,4-DB sodium salt, 2,4-D triethanolamine salt, mixed sodium salts of MCPA and 2,3,6-TBA, dalapon. MCPA at rates of 2 # and above gave excellent control of cutty grasses and was less expensive than dalapon, 2,4-D and MCPB and, in most cases, did not cause sufficient damage to clovers to warrant the use of MCPB instead. MCPA appeared to be translocated very efficiently from the foliage to the developing buds and along developing horizontal rhizomes and buds producing the current year's foliage were killed. The tissues in horizontal rhizomes connecting crowns appeared to stay alive for some months after treatment of the foliage and regrowth occurred either from such rhizomes or from surviving crowns.
For practical control, MCPA at 2 # applied in December-January with a spray gun in about 120 gal spray, or in 30 gal or more spray with a boom, was recommended. Follow-up treatments were needed to give complete control. - P.J.B. [O.W.]

540. AUSTRALIA, VICTORIA DEPARTMENT OF CROWN LANDS AND SURVEY. Spiny rush. Weed Control Sheet, 1959, 52A, pp.1.
Juncus acutus has been proclaimed a noxious weed in Victoria. Mechanical removal followed by cultivation for 1 or 2 seasons gives effective control. Where this is impracticable, a specially prepared oil-based 2,4-D (ester) at 0.5% is recommended. Burning after 6 months is advantageous. - D.M.L.S. [144(94)]

541. RADEMACHER, B. and KOTZ, K. (Inst.Pflanz., Stuttgart-Hohenheim,W.Germany). Uber ein neues Verfahren zur Bekämpfung von Huflattich (Tussilago farfara L.) und Krausem Ampfer (Rumex crispus L.) auf Ackerland. [Concerning a new method in the control of coltsfoot (T. farfara) and curly dock (R. crispus) in arable land. Z.PflKrankh., 1960, 67,(11/12), 675-80, (G.e.), tabs.2,bibl.2.
Control of coltsfoot has proved difficult as it predominates in situations where harvests tend to be late and stubbles have a complex weed flora. Experiments were set up to determine the value of mecoprop and applications of 2.3-2.9 l/ha a.e. in 800 l/ha water were made in May 1959 to winter wheat. Assessment just prior to harvest showed considerable reduction of coltsfoot, with yields of wheat up by ca. 15%. A second application in 1960 resulted in complete eradication of coltsfoot and a further increase in crop yield.
An MCPA + TCA mixture (proportions not stated) applied at 2.3-2.9 l/ha a.e. in 800 l/ha water was almost as effective as mecoprop in controlling coltsfoot, but reduced yields to some extent. Oats were less damaged than wheat. Curled dock [Rumex crispus] in the experimental plots reacted similarly to treatment; applications of 2.9 l/ha a.e. mecoprop in 800 l/ha water caused a reduction in stands in the first year; a single application the following year resulted in complete suppression. Amitrole 10 kg/ha did not control coltsfoot. - P.C. [270(43)]

542. MULDER, A. (Rijkstuinbouwconsulentschap voor Plantenziekten, Wageningen, Netherlands). Bestrijding van haagwinde in bessen. [Control of bellbine in bush fruits.] De Fruitteelt, 1960, 50, (36), 1057, (Du.).
Effective control of Calystegium sepium in bush fruits has been secured with MCPA 1 kg/ha and MCPB 2.5 or 5 l of 40% formulation applied after harvest, when the terminal buds are closed, and up to early October. Best results have been obtained with sprays applied in dry weather, overcast conditions and high humidity. Good control of Convolvulus arvensis in similar circumstances has been obtained by treatment with MCPB 2.5 l. - P.J.B. [Md.H.]

543. GREAT BRITAIN, MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. Spurrey. Adv.Leafl.Min. Agric.Fish.Fd, 1961, (rev.), 182 pp.4.
A revised version of the leaflet published in 1953. It includes the new information that dinoseb and a mixture of MCPA and 2,3,6-TBA give only partial control, and MCPB. 2,4-DB and mecoprop are more or less ineffective. - D.M.L.S. [455(42)]

544. TAYLOR, R.L. (Farm Chemicals Co., Port Napua, Nelson, New Zealand). Control of spurrey. Proc. 13th N.Z.Weed Control Conf., 1960, 39-46.
Cultural methods for controlling spurrey [Spergula arvensis], especially the use of hard grazing where the weed occurs in pastures and of other measures to prevent it setting seed are discussed. The use of the following chemicals is reviewed: (a) pre-em. - PCP, dinoseb, propham, chlorpropham, CDEC, EPTC, CDAA, MCPA, fenac, simazine, atrazine, monuron, fenuron, diuron, neburon; (b) pre-em. after emergence of spurrey - PCP, monochloroacetic acid (MCA) and chlorpropham; (c) hormone herbicides, MCPB, 2,4-DB, 2,4-D, mecoprop, MCPA, 2,3,6-TBA, MCPA + MCA; (d) contact herbicides, DNOC and dinoseb.
Of pre-em. treatments, propham, chlorpropham, CDAA, simazine, atrazine and monuron have all been effective. Of post-em. treatments, 2,3,6-TBA + MCPA, followed by MCPA, mecoprop and 2,4-D were the most effective. Almost complete control of small S. arvensis plants has been given by dinoseb ammonium, followed in effectiveness by MCA. - P.J.B. [O.W.]

545. MATTHEWS, L.J. (Dep.Agric., Wellington, New Zealand). Weed identification. St.John's wort. N.Z.J.Agric., 1960, 101, (1), 19.
Hypericum perforatum is described and illustrated. For its control 2,4-D ester up to 2 # applied at flowering + pasture improvement is recommended. In waste places, a second application should be given when regrowth is at the full-leaf stage. - D.M.L.S. [O.RE.]

546. MATTHEWS, L.J. (Dep.Agric., Wellington, New Zealand). Weed identification and control. Black nightshade. N.Z.J.Agric., 1960, 101, (2), 121.
Includes the following recommendations for control of Solanum nigrum: in peas - dinosam, monochloroacetate (MCA) 7.5 # + MCPB 0.75 # shows great promise; in cereals, maize, waste areas - MCPA or 2,4-D during early growth; in onions and carrots -chlorpropham 2-4 # pre-em.; in carrots - light aromatic oils for seedlings, and amiben or propazine up to 4 #; in nursery stock - chlorpropham, simazine or monuron, or mixtures of these; in field brassicas - MCA 15 # for seedlings; in vineyards - simazine or monuron + amitrole show promise. - D.M.L.S. [O.RE.]

547. HEALY, A.J. (D.S.I.R., Christchurch, New Zealand). Identification of thistles and thistle-like weeds. Proc. 13th N.Z. Weed Control Conf., 1960, 16-22, figs.5.
Keys are given for the identification of more than 30 species of thistles and thistle-like plants in the immature and mature growth stages. - P.J.B. [O.W.]

548. DELAHUNTY, E. (Dep.Agric., Ashburton, New Zealand). Control of nodding thistle. Proc. 13th N.Z.Weed Control Conf., 1960, 108-11, bibl.1.
Trials were carried out to determine the cheapest and most convenient method of chemically controlling nodding thistles [Carduus nutans] in pasture. 2,4-D amine salt 0.5 # applied to seedling thistles in April gave good control of C. nutans; in other months 1 # was required. MCPB sodium salt 0.5-1 # gave good control, the lower rate being sufficient in autumn, and the potassium salt of MCPA 1 # gave complete control in whatever month applied and the plots remained thistle-free the following summer.
Rates up to 50% higher than these were needed to kill mature thistles; but such rates were harmful to clover. It was recommended that, for practical control,

MCPA potassium salt, MCPB sodium salt, or 2,4-D amine salt at 0.5 # should be applied in April or September. MCPB should be used with young clover, but not in cold conditions. Rates up to 1 # should be used for thistles in the rosette stage. - P.C. [O.W.]

549. DERSCHEID, L.A., NASH, R.L. and WICKS, G.A. Thistle control with cropping, cultivation and chemicals. Weeds, 1961, 9,(1),90-102, tabs.3,bibl.14. [O.W.]

550. McKAY, H.C., AMES,G., HODGSON, J.H. and ERICKSON, L.C. (Idaho Branch Agric.Exp. Sta.,Tetonia,U.S.A.) Control Canada thistle for greater profits. Bull.Idaho agric.Exp. Sta., 1959, 321,1-14, figs.9,tabs.2.
Trials on the control of Canada thistle [Cirsium arvense] were carried out during 1953-7, with a variety of cropping systems, 2,4-D spray, nitrogenous fertiliser and culture methods of weed control, used alone and in various combinations. One season of fallow, with cultivations every 21 days, eliminated 99% of established C. arvense plants, but had to be supplemented by chemical control. Applications of N 80 # made in spring before sowing wheat, in combination with 2,4-D (amine) 2 # in 30 gal water during the first year, and 3 # in subsequent years, gave effective control of C. arvense, but led to a build up of Avena fatua in land previously infested. It appeared best to discontinue the N + 2,4-D treatment after 2 or 3 successive years, and to follow it by 4 years of lucerne, lucerne + grass, or grass alone. The use of these crops, cut twice a year and sprayed with 2,4-D at about 6 weeks after growth began, gave 99% control of C. arvense at the end of 4 years. Control was achieved if these measures were followed by a sequence of potatoes or other row crops for 2 years, on soil of low fertility. Yields increased from 24.2 bushels/ac on the control plots to 67.9 bushels on plots where 2,4-D + N were used. Profits increased from $12 per ac where no weed control was employed to $76 per ac where 2,4-D + N was applied. - P.C. [16(79.6)]

551. SCHMIDL, L. (Dep.Crown Lands & Survey, Victoria,Australia). The control of California thistle in Victoria. Proc.2nd Aust. Weeds Conf., 1960, Pap. 33, pp.3.
A trial is described in which the superiority of the phenoxybutyrics over the phenoxyacetics (2,4-D and MCPA) was demonstrated. Applied in the budding stage in 2 successive years, MCPB (sodium) 2 # gave an average stand reduction of ca. 95%. Most of the horizontal roots were killed and bud and rhizome development was inhibited; 1 # was less effective. 2,4-DB (ester) 1 and 2 # also gave good results and was superior to 2,4-DB (sodium). Amitrole 2 # reduced stand density only slightly the first year and the plants regenerated freely, but after the second treatment density was reduced by more than 70%. - D.M.L.S. [O.W.]

552. AUSTRALIA, VICTORIA DEPARTMENT OF CROWN LANDS AND SURVEY. Prairie ground cherry - Physalis viscosa. Weed Control Sheet, 1959, 45, pp.1.
P. viscosa has become a serious problem in Victoria but can be controlled by foliage sprays of amitrole 0.2% applied between flowering and fruiting with repeat treatment on any regrowth the following year. Cultivation tends only to spread it. - D.M.L.S. [142(94)]

553. AUSTRALIA, VICTORIA DEPARTMENT OF CROWN LANDS AND SURVEY. Pampas lily of the valley. Weed Control Sheet, 1958, 43, pp.1.
Recommends boron trioxide at 10 lb/100 ft^2 applied just before flowering for the control of Salpichroa rhomboidea. Neither hormone-type nor contact weedkillers, such as arsenicals or chlorates, will give permanent control. The plant is described. - D.M.L.S. [141(94)]

554. MEADLY, G.R.W. (Dep.Agric.,Perth, W.Australia). Weeds of western Australia. Cape tulip (Homeria breyniana (L.) Lewis and H. miniata Sweet). J.Agric.W.Aust., 1960, 1,(7),593-9, figs.4.
Includes the following information: a mixture of old sump oil with kerosene or diesoline at 1 gal/24 yd^2 has given some control but results have been variable and costly. The best and most uniform results have been given by 2,4-D (ester) 2 #; the amine and sodium salt have sometimes been as effective, but not always. In the Avon Valley, a cropping and fallowing programme continued for several years has greatly reduced infestations. Crops used included peas. - D.M.L.S. [O.RE.]

555. AUSTRALIA, VICTORIA DEPARTMENT OF CROWN LANDS AND SURVEY. Recommendations for the control of skeleton weed [Chondrilla juncea]. Weed Control Sheet, 1960, 50, pp.2.
Isolated plants and patches: monuron 6 oz/gal water or sodium borate 1 lb/10 ft^2.
In crop land: 2,4-D (amine) 0.75 # applied

after stooling but before grain can be felt in the stem, with control of regrowth after harvesting by stubble burning, sheep grazing or 0.2% 2,4-D (ester).

In pasture: 2,4 D (ester) 2 # for badly infested pasture though clovers will be affected, or spot spraying with 0.2% 2,4-D (ester).

In orchards, vineyards etc. - sodium chlorate 1 lb/2 gal water.

2,4-D and sodium chlorate give effective top kill and prevent seed production but do not kill the plant, and retreatment the following year is necessary. - D.M.L.S. [143(94)]

556. ALLEN, T.J. and DOLLAHITE, J.W. Getting rid of tumbleweeds. Texas agric. Progr., 1960, 6,(4),10,22.

Describes the use of tractors fitted with rotary cutters for pulverising tumbleweeds [Salsola pestifer] accumulations along fence lines. - P.J.B. [130(76.4)]

557. RANKIN, A.R. (Dep.Agric.,Invercargill, New Zealand). Weeds of South Otago and Southland. Proc. 13th N.Z.Weed Control Conf., 1960, 11-15.

Weed infestation in the southern part of South Island is described and the problem evaluated. Weeds of major economic importance are classified geographically and ecologically. - P.C. [O.W.]

558. LANUZA, E.A., GATCHALIAN, F.S., OYARDO, E.O. and LUARDO, B.R. Progress report on the survey of weeds in Davao abaca plantations. Philippine J.Agric.1956, 1959, 21,(1/4),17-29, tabs.5 bibl.14.

124 weed species belonging to 39 families were collected from both old and new abaca plantations under open conditions. 21 species from the old plantations and 19 from the new were infested with aphids, 4 with leafhoppers and 6 with mosaic. It was not known if these insect species were vectors of abaca mosaic. - J.W.T. [C.A.]

559. IZARD, C. L'orobanche du tabac. [Tobacco broomrape.] Ann.Inst.Exp.Tabac Bergerac, 1959, 3,(2),299-316, (F.e.), figs.1,tabs.4,bibl.18.

A short review covering the biology of Orobanche ramosa, methods of distribution, effect on host (a list of hosts is included), ecology, in vitro germination experiments, biochemistry of seeds, and a brief discussion of control (by various management practices and by soil sterilisation by rindite (a mixture of glycol chlorohydrin, ethylene dichloride and carbon tetrachloride) and by D.D. (1,3-dichloropropane + 1,2-dichloropropene)). It is noted that (1) germination may be stimulated by secretions from plants other than host plants, and (2) that seeds are capable of spontaneous germination in pure water. - D.M.L.S. [Md.H.]

560. CAYOUETTE, R. and BRASSARD, F.L. (Div.Mauvaises Herbes,Min.Agric.,Quebec, Canada). La presence de l'herbe a la puce (Rhus radicans) au Saguenay. [The presence of poison ivy (R. radicans) in the Saguenay region.] Nat.Canad., 1960, 87,(4),107-111.

A brief account of the discovery of 4 small colonies of R. radicans var. Rydbergii in the Saguenay region. - D.M.L.S. [246(71)]

561. MAJOR, W.C.T. How to avoid milk taints. Qd agric.J., 1960, 86,(6),365-9, figs.4.

Weeds mentioned as causing dairy taints are Coronopus didymus, Lepidium bonariense, L. hyssopifolium, Capsella bursa pastoris and Apium leptophyllum. - D.M.L.S. [O.RE.]

562. PETERSEN, H.I. and PETERSEN, E.J. Forsøg med kemiske midler-til bekaempelse af al vegetation. [Trials with chemicals for total weed control.] Tidsskr.Planteavl, 1960, 64,(2),331-48, figs.10.

The trials reported were carried out in Denmark during 1952-8 in most cases on very heavy clay soil. Sodium chlorate at 100 and 200 kg/ha had a relatively rapid action, but its effect had disappeared after about 12 months. Calcium chlorate and so-called non-inflammable sodium chlorate were slightly less effective than sodium chlorate, but their effect lasted for a similar period. TCA was similar to sodium chlorate in its effect on grasses, though slower-acting; against dicotyledonous weeds it was less effective, even when mixed with 2,4-D. Ammonium sulphamate at 200 and 400 kg/ha was similar in effectiveness to sodium chlorate at 100 and 200 kg; it seemed better suited for use on woody weeds than as a total herbicide. Borax at rates of 800 kg/ha was ineffective against heavy stands of weeds; rates of about 5000 kg/ha gave total and very long-lasting weed control. At similar rates of application.

monuron was slower-acting, but more effective and persistent than sodium chlorate, while simazine was still more effective and persistent than monuron when used at equivalent rates. - P.J.B.
[102(498)]

563. DOVASTON, H.F. (West Scot.Agric. Coll.,Glasgow,Scotland). Weeds on paths and roadways. Scot.Agric., 1960, 40,(2), 114.
At Auchincruive, a path sprayed with simazine 10 # after first killing established weeds by hoeing or with a flame gun, is still,after 15 months,quite free from weeds, moss and algae. - D.M.L.S.
[O.RE.]

564. WARD, R.K. (Rukuhia Soil Res.Sta., Hamilton,New Zealand). Total weed control. Proc. 13th N.Z.Weed Control Conf., 1960, 66-70, bibl.1.
Dalapon, amitrole, and dalapon + amitrole were tested, and compared with chlorate + chloride mixtures, for total weed control on railway tracks and banks. The most satisfactory control was secured by dalapon + amitrole; the ratio in which they were mixed did not appear to be critical, provided that the rates of dalapon and amitrole were not less than 10 # and 4 # respectively. This mixture controlled more species than the chlorate + chloride mixture, but the cost was slightly higher; there was less interference with traffic, as reduced volumes of spray enabled treatment to be carried out at increased speeds. - P.C. [O.W.]

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See also 609.

565. GOWING, D.P. and LEEPER, R.W. (State Univ.,Iowa City,Iowa,U.S.A.) Studies on the relation of chemical structure to plant growth-regulator activity in the pineapple plant. II. Compounds related to phenoxyalkylcarboxylic acids, phthalamic acids, and benzoic acids. Bot.Gaz., 1960, 121,(4),249-57, tabs.6, bibl.13.
Results of tests with 151 esters, amides, nitriles, amino acid and other derivatives of phenoxyalkylcarboxylic acids and related compounds for activity in flower induction and inhibition of flowering in pineapple (Ananus comosus), and toxicity to the plant, are given. The response in the split pea stem curvature test is also recorded for most of the compounds. - From Authors' Summary. - J.W.F. [O.W.]

566. KING, L.J. (Boyce Thompson Inst., Yonkers,New York State U.S.A.) Substituted aryloxy alkanol derivatives for use as biologically activated pre-emergence herbicides. Proc.4th internat.Congr.Crop Protect.1957, 1959, 557-64, tabs.1,bibl.14.
The following aspects of studies with 2,4-DES are reviewed: characteristics and herbicidal activity, activation in the soil, leaching and uses, including use for weed control in strawberries, nursery plantings, groundnuts, asparagus, and in turf. The physical properties of a series of substituted aryloxy alkanols are tabulated and 2-(2,4-dichlorophenoxy) ethyl benzoate and sodium 2-(2,4,5-trichlorophenoxy) ethyl sulphate are discussed in more detail. - P.J.B. [O.W.]

567. GYSIN, H. and KNUSLI, E. (Res.Lab., Geigy A.G.,Basel,Switzerland). Triazinderivate als Herbizide. [Triazine derivatives as herbicides.] Proc.4th internat.Congr. Crop Protect.1957, 1959, 549-53, (G.).
A review of different triazine derivatives and their characteristics. See also Weed Abstr., 6,665. - P.J.B. [O.W.]

568. KOOPMAN, H. and DAAMS, J. New s-triazine herbicides. Proc.4th internat. Congr.Crop Protect.1957,1959, 555.
Of triazine compounds synthesized, 2-alkyloxy and 2-alkylthio-4,6-dichloro-1,3,5-triazines were slightly more active than the 2-alkylamino derivatives. Compounds with 3-6 carbon atoms in the side chain had the greatest activity. - P.J.B. [O.W.]

569. BURNSIDE, O.C. and BEHRENS, R. (Univ. Minnesota,Minneapolis U.S.A.) Phytotoxicity of simazine. Weeds, 1961, 9,(1),145-57, figs.3,tabs.7,bibl.12.
Aspects investigated included crop response to simazine and climatic and edaphic factors which affect its phytotoxicity. Clintland oats, Flambeau soybeans and single-cross A502 x A556 maize were used as bioassay crops for determining different concentrations of simazine in the soil. These crops were sensitive to the following ranges of concentration: 0.25-1, 0.5-4 and 4-256 p.p.m.w.

Temperature, light and other variables had little effect on the bioassay results with soybeans and of the 3 this species was considered best for this purpose. The order of tolerance of 6 crops to simazine, starting at the most tolerant, Norghum sorghum, Marine flax, Flambeau soybeans, Caribou rye, Selkirk wheat and Kindred barley. In field trials applying 1 in. of water after having applied simazine 2 or 4 ℔ increased its toxicity to weeds and applying 2 in. of water still further increased phytotoxicity. In soil pH studies, maize yields declined as rates of simazine and soil pH values increased; the interaction between simazine rate and soil pH was highly significant. Soils high in organic matter and/or clay content caused reductions in phytotoxicity of simazine. Increasing the soil temperature from 59 to 86°F increased the phytotoxicity of simazine to maize. - P.J.B. [O.W.]

570. GREAT BRITAIN, FISONS PEST CONTROL LIMITED. Prometryne experimental weedkiller. Tech. Inform. Leafl., Fisons Pest Control Ltd., (n.d.), pp.7.

2-methylmercapto-4,6-bis(isopropylamino)-s-triazine (common name Prometryne, code number G 34161) is formulated as a 50% wettable powder, has a solubility of 48 p.p.m. in water (at 20°C) and is soluble in most organic solvents. Its acute oral LD 50 for mice and rats is 3750 mg/kg and it presents no hazards to man. Like simazine and atrazine, it is taken up both by roots and foliage but its uptake is more rapid leading to quicker action, it is less dependent on rainfall, and has a shorter persistence in the soil. It will control almost all annual weeds, but certain leguminous and cruciferous plants are somewhat tolerant. It is unsuitable for the control of established deep-rooted perennials. Good control of the following has been obtained with 0.5-2 ℔ a.i. Amaranthus retroflexus, Anagallis arvensis, Atriplex patula, Euphorbia sp., Mercurialis annua, Panicum sanguinale, Papaver rhoeas, Poa annua, Polygonum spp., Avena fatua, Capsella bursa pastoris, Chenopodium album, Senecio vulgaris, Setaria glauca, S. italica, S. viridis, Stellaria media, and Portulaca oleracea. The following are controlled by 1-2.5 ℔ a.i. post-em. but appear to be resistant to 5 ℔ pre-em.: Fumaria officinalis, Geranium sp., Lamium purpureum, Medicago sativa, Plantago major, Sinapis arvensis, Sorghum halepense (seedlings), Stachys annuus and Veronica agrestis. The following have been resistant to 2.5 ℔ post-em.: Agropyron repens (is more susceptible to pre-em.), Artemisia verlatorum, Brachypodium pinnatum, Cirsium arvense, Daucus carota, Eryngium campestre, Galium aparine, Mentha sp. Oxalis stricta and Phragmites communis.

Prometryne appears especially promising in large-seeded crops (e.g. peas, beans, soybeans, groundnuts) and pre-em. in potatoes or pre-planting in tomatoes. Trials with 0.5-2 ℔ in these and in leguminous crops are suggested and also with 1-3 ℔ (as a split application pre- and post-em.) in cotton. Only low rates should be used in rice. - D.M.L.S. [460(42)]

571. ROBINSON, B.D. (ICIANZ, Merrindale Biol. Res. Sta., Croyden, Victoria, Australia). Diquat - a new herbicide and desiccant. Proc. 2nd Aust. Weeds Conf., 1960, Pap. 58, pp. 11, bibl. 7.

A brief review covering chemical and toxicological (rats, rabbits, fish and guinea pigs) data, uptake and translocation, mode of action, desiccation (firebreaks, potatoes, cotton, legumes for seed) and weed control. The following information is included: water lettuce and duckweed [Lemna minor] were killed in small field experiments by 2-4 ℔ and the green alga Cladophora by ca. 13 mg/ml in an irrigation canal. Cassinia aculeata and other woody plants can be dried-out for burning by 3-6 ℔. In preliminary spot trials, 0.2% gave very good control of grape vine suckers. The following annuals are easily killed by diquat: Carthamus lanatus, Datura stramonium, Cryptostemma calendula and Veronica spp. - D.M.L.S. [O.W.]

572. GREAT BRITAIN, PLANT PROTECTION LIMITED. Paraquat di(methyl sulphate), previously PP.910, a new herbicide. Publ. Plant Protection Ltd., 1961, pp.6.

Paraquat (1,1'-dimethyl-4,4'-bipyridylium) is the name given to the free radicle. Two salts are currently under test, the di(methyl sulphate) (PP.910) and the dichloride (PP.148). Paraquat di(methyl sulphate) is very soluble in water and suitable for use with non-ionic or cationic (not anionic) wetting agents. The single oral dose LD 50 in rats is 157 mg/kg and the single subcutaneous injection LD 50 is 24 mg/kg; the compound caused skin irritation. Paraquat salts are very rapidly absorbed into the aerial parts of plants and can be translocated, though death follows absorption so rapidly in some species that translocation downward

is inhibited and a second application 2-3 weeks later may be required to give adequate control. Phytocidal action does not usually extend below ground level. Single applications have controlled non-rhizomatous grasses and, in some cases, species with restricted rhizome systems, also. Suggestions are given for the experimental use of paraquat. In young, replanted rubber paraquat di(methyl sulphate) can be used safely once brown bark has developed at the base of the trees and rates of 1-1.5 # + 0.1% v/v Lissapol NX has given excellent control of grass and broad-leaved weeds before the development of a complete canopy. In mature rubber with a complete canopy, single applications of 1-1.5 # have given control of grass and broad-leaved weeds for long periods. Certain weeds such as Paspalum sp. may require retreatment. Paraquat sprayed up to the trunks of grapefruit trees and around banana stools has controlled weeds with no crop damage. In orchard and bush fruit crops, paraquat 1 # + 0.1% Lissapol NX gave good control of grass growth around the tree bases; secondary invasions of broad-leaved species could be controlled by retreatment. Paraquat di(methyl sulphate) at 2 # in 20 gal spray applied to kill swards suppressed almost all grasses as well as seedling sedges and rushes. For total weed control, paraquat di(methyl sulphate) at 2 #, alone or with residual herbicides at rates up to 20 #, is recommended for trial. Paraquat is immediately absorbed and inactivated by soil and is less affected by rainfall after application than are most other herbicides. - P.J.B. [O.W.]

573. UNITED STATES, MONSANTO CHEMICAL COMPANY. (Agric.Chem.Div., St.Louis 66, Missouri, U.S.A.) CP 23426. Tech.Inf.Sheet Monsanto Chem.Co., 1961, pp.2.

CP 23426 is the code number for 2,3,3-trichloroallyl diisopropylthiolcarbamate. Tests in 1960 are stated to have indicated that CP 23426 may be nearly twice as effective as 2,3-dichloroallyl diisopropylthiol carbamate against wild oats [Avena fatua]. CP 23426 is classed as "slightly toxic" (LD 50 to rats 1340-1810 mg/kg) and it is a moderate skin irritant and mild to moderate eye irritant. Rates recommended for testing are 0.5-1.5 #; control of wild oats should be secured at the lower rates and of Setaria spp. at the higher. Crops tolerant at these rates include: flax, barley, maize, peas (canning and dry), lentils, mustard and safflower; semi-tolerant crops are wheat and forage grasses. It is considered likely that incorporation of CP 23426 as soon as possible on the day of application will be necessary to avoid losses from the soil surface. Incorporation should be to a depth of 2 in. or less. - P.J.B. [O.W.]

574. UNITED STATES, STAUFFER CHEMICAL COMPANY. (380 Madison Ave, New York 17, N.Y., U.S.A.) R-1856. A selective herbicide. Tech.Bull.Stauffer Chem.Co., 1961, pp.2.

R-1856 is t-butyl di-n-propylthiolcarbamate which shows promise for controlling Cyperus rotundus, Sorghum halepense (from rhizomes and seed), Setaria spp., Digitaria spp., Echinochloa crus galli, Avena fatua and other grass weeds. The herbicide should be incorporated into the soil immediately after application and before the weeds emerge. Its LD 50 for male albino rats is 5250 mg/kg. Crops on which it is suggested R-1856 should be tested are given; those which have been injured by 5-10 # pre-sowing include: peas, soybeans, lima beans, milo, oats, wheat, Sudan grass and all lawn grasses. A rate of 5 # in 20-100 gal water, incorporated 3 in. deep, is recommended. A rate of 10 # is suggested for trials with Cyperus spp., Sorghum halepense (from rhizomes), Agropyron repens from seed and Poa annua. Rates up to 10 # have given poor control of broad-leaved weeds in field trials. Emulsifiable concentrate and granular formulations are available for test. - P.J.B. [O.W.]

575. UNITED STATES, STAUFFER CHEMICAL COMPANY. (380 Madison Ave, New York 17, N.Y., U.S.A.) R-1870, R-2007, selective herbicides. Tech.Bull.Stauffer Chem.Co., 1961, pp.3.

R 1870 (ethyl di-n-butylthiolcarbamate) and R-2007 (ethyl diallylthiolcarbamate) have respective solubilities in water of nil and 750 p.p.m. at 20°C; both are soluble in organic solvents. The acute oral LD 50 to male albino rats is 2.33 ml/kg for R-1870 and 2132 mg/kg for R-2007. These compounds are similar to EPTC in controlling Cyperus rotundus and annual grass weeds, but show different crop selectivity. Weeds controlled prior to emergence by R-1870 are listed as: Cyperus rotundus, Lolium spp., Setaria spp., Digitaria spp., Echinochloa crus galli, Avena fatua and Amaranthus retroflexus and by R-2007 as: Cyperus rotundus, Setaria spp., Digitaria spp., Echinochloa crus galli and Avena fatua. R-1870 is suggested for trial in the following crops: spinach, broccoli, cauliflower, collards, tobacco, maize, cotton, soybeans and kale and R-2007 for trial in: red beet, peas, lima beans, lentil, pineapple and spinach. Immediate soil incorporation with rotary cultivators or discs after

application at rates of 4-6 # before sowing the crop is recommended. Samples are available for test. - P.J.B. [O.W.]

576. UNITED STATES, ELI LILLY AND COMPANY. (Greenfield Laboratories, Greenfield, Indiana, U.S.A.) Technical information on Diphenatrile. Publ. Eli Lilly & Co., 1960, pp.2.
Diphenatrile is the generic name for diphenylacetonitrile. Its solubility in water is 220 p.p.m. at 27°C and it is soluble in most organic solvents. Its acute oral LD 50 to mice is >3500 mg/kg and it is non-irritant to skin. Diphenatrile is recommended for full-season, pre-em. control of seedling grasses in turf, flower beds, shrubbery plantings and in broad-leaf ground cover. Its recommended rate of use is 30 #. Susceptible weed grasses include: Echinochloa crus galli, Digitaria spp., Setaria spp., Cenchrus sp. and Panicum capillare. Resistant turf-grasses include: Poa spp., Cynodon dactylon, Agrostis spp., Axonopus affinis, Festuca spp., Stenotaphrum secundatum and Zoysia japonica. Resistant ornamentals include; annual flowers, evergreen shrubs, broad-leaved shrubs, myrtle, ivy, roses, chrysanthemums and ornamental bulbs. Samples are available for test. - P.J.B. [O.W.]

577. UNITED STATES, ELI LILLY AND COMPANY. (Greenfield Laboratories, Greenfield, Indiana, U.S.A.) Technical information on Diphenamid. Publ. Eli Lilly & Co., 1960, pp.3.
Diphenamid is the tentative generic name of N,N-dimethyl-α,α-diphenylacetamide. Its solubility in water is 260 p.p.m. at 27°C and it is moderately soluble in acetone, dimethyl formamide and the cellosolves. The oral LD 50 for mice is 700 mg/kg. Diphenamid is a pre-em. herbicide and has little contact effect on most crops and weeds, but apparently acts through the roots. Crops listed as tolerant include: tomatoes, peppers, strawberries, groundnuts, snap beans, soy-beans, lima beans, peas, lucerne, lespedeza, cotton, dichondra, flax, lettuce, mustard, onions, radishes, peppermint and sweet potatoes. Moderately tolerant crops are: beet, cabbage, carrots, cantaloupes, cucumbers, maize, spinach, birdsfoot trefoil and wheat. Susceptible crops are: Trifolium spp., asparagus seedlings, oats, Setaria spp. and turfgrass seedlings. Susceptible weeds are: Datura stramonium, Cyperus rotundus, Abutilon theophrasti and Ambrosia artemisiifolia. Moderately tolerant are: Chenopodium album, Portulaca oleracea, Brassica sp. and Avena fatua. Resistant are: Digitaria spp., Echinochloa sp., Setaria spp., Sorghum halepense (seedlings), Stellaria media, Amaranthus retroflexus, Polygonum persicaria and Franseria sp. Crops and weeds listed as susceptible are killed by diphenamid at 2-4 # and those as resistant tolerate > 8 #. Rates of 4-6 # are suggested for use in practice. Samples are available for test. - P.J.B. [O.W.]

578. UNITED STATES, ELI LILLY AND COMPANY. (Greenfield Laboratories, Greenfield, Indiana, U.S.A.) Technical information on Trifluralin and Dipropalin. Publ. Eli Lilly & Co., 1961, pp.2.
Trifluralin is the tentative generic name of N,N-di-n-propyl-2,6-dinitro-4-trifluoromethylaniline and Dipropalin is the name of N,N-di-n-propyl-2,6-dinitro-4-methylaniline. Their respective solubilities in water are 24 and 304 p.p.m. and they are readily soluble in most organic solvents. They are recommended for experimental use for full-season pre-em. control of seedling grasses in turf at 2 and 4 # for Trifluralin and 4-8 # for Dipropalin. In field trials another compound, N,N-di-n-propyl-2,6-dinitroaniline, gave 93% control of seedling grasses at 5 # and 96% control at 10 # and no damage to established turf was caused by rates up to 40 #. Trifluralin and Dipropalin appear to have the same selectivity but much greater activity, than this compound. Experimental samples are available. - P.J.B. [O.W.]

579. UNITED STATES, NIAGARA CHEMICAL DIVISION, FOOD, MACHINERY AND CHEMICAL CORPORATION. (Middleport, New York, U.S.A.) Technical information 1960. Solan, an experimental herbicide. Publ. Niagara Chem. Div., Fd, Mach. & Chem. Corp., (n.d.), pp.9.
Crops resistant and susceptible to Solan (N-(3-chloro-4-methylphenyl)-2-methylpentanamide) are listed. Weeds susceptible to broadcast post-em. topical applications at 4 # in 50-100 gal spray when the weeds were not more than 1.5-2 in. tall have included: Digitaria spp., Echinochloa crus galli, Urtica urens, Polygonum aviculare, P. persicaria, Chenopodium album, Amaranthus retroflexus, Mollugo verticillata, Portulaca oleracea, Spergula arvensis, Stellaria media, Cerastium vulgatum, Capsella bursa pastoris, Raphanus raphanistrum, R. sativus, Brassica rapa, Sisymbrium altissimum, Abutilon theophrasti, Ipomoea purpurea, Galeopsis tetrahit, Solanum nigrum, Richardia scabra, Ambrosia

artemisiifolia, Senecio vulgaris, Cirsium arvense. Weeds poorly controlled by post-em. sprays include: Poa annua, Lolium perenne, Hordeum murinum, Cyperus spp., Convolvulus arvensis, Xanthium spinosum and Bidens vulgata. Trial results have indicated that 40 established varieties of field tomatoes are resistant to Solan at 4 #; only var. Bonnie Best was injured. In California conditions, however, post-em. treatments injured tomatoes. It is suggested that trials with tomatoes be based on the 4 # rate, and for carrots, celery and parsley, on the 4-6 # rates. - P.J.B. [O.W.]

580. UNITED STATES, NIAGARA CHEMICAL DIVISION, FOOD, MACHINERY AND CHEMICAL CORPORATION. (Middleport, New York, U.S.A.) Technical information 1961. Niagara Dicryl, an experimental herbicide. Publ. Niagara Chem. Div., Fd, Mach. & Chem. Corp., (n.d.), pp. 16.
Aspects of Dicryl (N-(3,4-dichlorophenyl) methacrylamide) reviewed include registration status, properties, available formulations, crop and weed response, toxicology, and safety precautions and an appendix contains a list of susceptible and resistant weeds. Suggestions for testing Dicryl + sodium dimethylarsonate (DMA) are given. Trials in Mississippi with cotton have indicated that a combination of Dicryl 0.75-1 # + DMA 1-3 # (broadcast) has controlled weeds older and larger than those controlled by either alone. The higher rates of DMA are suggested for those instances where the weeds are relatively older and the cotton large enough to permit the use of directed sprays. Mixtures of Dicryl 0.75 # + DMA 0.75 # have stunted young grass (5-10 days old) and permitted normal growth of cotton. See also Weed Abstr., 9, 1383. - P.J.B. [O.W.]

581. UNITED STATES, PENNSALT CHEMICAL CORPORATION. (Tacoma, Washington, U.S.A.) Endothal derivatives. Experimental herbicides. Devel. Bull. Penco Agric. Chem., (n.d.), 12, pp. 2.
The following endothal derivatives were selected for evaluation in 1961: (a) TD-47, the di-N,N-dimethylcocoamine salt, (b) TD-191, the mono N,N-dimethylcocoamine salt, (c) TD-66, the di oleyl amine salt, and (d) TD-266, the mono oleyl amine salt. TD-47 and TD-191 are water- and oil-soluble and TD-66 and TD-266 oil-soluble and water-insoluble. The following crops have shown resistance to these chemicals (rates given): TD-66 and TD-266 pre-em. - beet, spinach, onions, lima beans, groundnuts; TD-47 and TD-191 post-em. - beet, spinach, onions, sweet potatoes, sorghum, wheat and oats. The experimental use of TD-191 as a desiccant is suggested for a number of crops. - P.J.B. [O.W.]

582. UNITED STATES, PENNSALT CHEMICAL CORPORATION. (Tacoma, Washington, U.S.A.) Aquathol. A new aquatic herbicide. Tech. Bull. Penco Agric. Chem., 1961, No. A-22, pp. 4.
Aquathol contains 19.2% aqueous solution of disodium endothal and Aquathol G 5% disodium endothal (technical) on an inert clay carrier. At a normal usage rate of 1-2 p.p.m. endothal there appears to be little risk of fish mortality. In conditions of high biological activity >80% of applied endothal had disappeared within 24 hours and complete disappearance of rates up to 10 p.p.m. can be expected within 4-5 days. Data are given of endothal concentrations required to kill the following species with (a) an entire pond, or (b) spot or lake-margin treatment: Zannichellia spp., Ceratophyllum spp., Heteranthera spp., Myriophyllum spp., Najas spp., Potamogeton americanus, P. amplifolius, P. crispus, P. diversifolius, P. filiformis, P. natans, P. pusillus, P. pectinatus, P. zosteriformis, Sparganium spp., Wolffia spp., Spirodela spp. and Lemna spp. - P.J.B. [O.W.]

583. UNITED STATES, PENNSALT CHEMICAL CORPORATION. (Tacoma, Washington, U.S.A.) TD-47 algicide. TD-191 algicide. Devel. Bull. Penco Agric. Chem., (n.d.), 8b, pp. 2.
TD-47 is the di N,N-dimethylcocoamine salt of endothal and TD-191 is the mono N,N-dimethylcocoamine salt. Both are claimed to be effective algicides when used at rates of 0.05-5 p.p.m. (a.e.) (0.13-1.3 lb a.e./ac ft of water on an overall basis). For marginal treatments, 1-2 p.p.m. (2.6-5.2 lb a.e./ac ft) is recommended and rates of >0.3 p.p.m. are also said to control many submerged aquatic weeds. For controlling algae in cooling towers and similar situations where fish hazards are no problem, initial treatments with TD-47 at 3-5 lb a.e./million lb (120 000 gal) water with follow-up treatments at 2-6 week intervals, are recommended. In drainage ditches where there is hazard to fish, rates of 0.3-0.5 p.p.m. TD-47 or TD-191 (2.5-4.25 lb/million cu ft) for 1-2 hours, are recommended. For Cladophora control, the potential value of granular formulations is indicated. - P.J.B. [O.W.]

584. LEASURE, J.K. and JOSEPHS, M.J. (Agric.Chem.Res.Dep., Dow Chem.Co., Midland, Michigan, U.S.A.) Acetylenic derivatives as herbicides. Weeds, 1961, 9, (1), 103-5, figs. 1, tabs. 1.

The following is a summary of the herbicidal characteristics of a number of acetylenic derivatives which have shown biological activity: (a) very active when used pre-em., (b) more active against broad-leaved than grass species, (c) almost completely inactive when used as post-em. foliar treatments, (d) very active when applied to the root systems of plants at all stages of development, (e) moderately persistent in the soil. One of the most active acetylenic derivatives was 1-ethynylcyclohexanol. Compounds such as isopropylcyclohexanol were inactive, suggesting that the -C≡C- group is required for significant herbicidal activity; there was evidence that the spatial configuration around this group was also important. In glasshouse studies, 1-ethynylcyclohexanol at 20 # pre-em. gave complete kill of such species as radish, Setaria sp., Avena fatua, maize, wheat, soybeans, cotton, Sorghum halepense, mustard, sugar beet, Digitaria sp. and Ipomea sp. In the field, rather higher rates than 20 # were required to give complete kill; at lower rates or with less active compounds, complete control of broad-leaved species was maintained, but grasses grew normally. Soil moisture was an important factor. Data are given of pot studies on persistence with 1-ethynylcyclohexanol over a 27-week period. - P.J.B.

[O.W.]

585. WELDON, L.W. and TIMMONS, F.L. (Wyoming Agric.Exp.Sta., Laramie, U.S.A.) Photochemical degradation of diuron and monuron. Weeds, 1961, 9, (1), 111-6, figs.2, tabs.1, bibl.9.

In the studies reported, 10 ml of solutions of 10 p.p.m. monuron or diuron in 95% ethanol were placed in petri dishes. The ethanol was allowed to evaporate, leaving the herbicides behind. These were then subjected to ultra-violet irradiation with an 85 watt mercury vapour lamp for 2, 8 or 28 hours. As determined by changes in light transmission in a spectrophotometer, both monuron and to a greater extent diuron underwent photochemical degradation during irradiation. In biological tests, using oat plants, irradiation for 28 hours reduced the biological activity of both herbicides by about 75%. - P.J.B. [O.W.]

586. FOY, C.L. (Univ.California, Berkeley, U.S.A.) The adaptation of qualitative and quantitative techniques for determination of radioactive dalapon in plant tissues. Hilgardia, 1960, 30, (5), 153-73, bibl.22.

Simplified techniques developed in the course of studies of the absorption, distribution and metabolism of dalapon in plants are described, together with details of modifications to standard procedures. By means of gross autoradiography and counting, both qualitative and quantitative data were obtained and a rapid, simple method for quantifying data obtained by the direct counting of dry, ground plant material containing radioactive dalapon is described. Extraction and fractionation procedures were developed and the techniques of paper partition cochromatography and autoradiography were adapted to the detection of dalapon and related metabolic degradation products. The desirability of adapting and using concurrently all the techniques described is stressed and it is observed that the techniques and principles should be adaptable to studies on other compounds beside dalapon. - P.J.B.

[O.W.]

587. RAGAB, M.T.H. and McCOLLUM, J.P. (Univ.Illinois, Urbana, U.S.A.) Degradation of C^{14}-labeled simazine by plants and soil microorganisms. Weeds, 1961, 9, (1), 72-84, figs.8, tabs.1, bibl.16.

Sweet corn and cucumber plants were grown in enclosed systems and received 10 µc of simazine labelled in the ring with ^{14}C. Both species metabolised a proportion of the simazine to CO_2. During the first 2 nights after application, cucumber plants degraded considerably more simazine to CO_2 than did the maize plants, but the amount they degraded subsequently declined markedly, which may have been associated with declining photosynthetic efficiency. The sweet corn plants continued to grow well in the simazine solution. In both species, there was more simazine activity in the roots than in the stems or leaves and a higher level of simazine activity in extracts from cucumber plants than in those from sweet corn. The existence of unchanged simazine in the leaves and stems of treated plants was demonstrated. Studies with sterile and non-sterile soil indicated the importance of soil microorganisms in breaking down simazine. - P.J.B.

[O.W.]

588. HURTIG, H. (Res.Branch,Dep.Agric., Ottawa,Canada). Pesticide residue problems. Agric.Inst.Rev., 1960, 15,(5),11-15,53-4, figs.1,tabs.1.
The subject is discussed particularly from the international standpoint and an outline is given of the work so far done by the "F.A.O. Panel of Experts on the use of pesticides in agriculture", the Western European Union "Working Party on Poisonous Substances in Agriculture", and the "Working Party on Crop Production Pesticides" of the European and Mediterranean Plant Protection Organisation. Canadian problems are also discussed. - D.M.L.S. [O.RE.]

589. EHRINHAUER, H. (Plant Hus.Dep.,Roy. School Agric.,Uppsala,Sweden). Untersuchungen über die Inaktivierung der Dichlorpropionsäure (Dalapon) und Trichloressigsäure (TCA). [Experiments on the inactivation of dichlorpropionic acid (dalapon) and trichloroacetic acid (TCA).] Proc.14th internat.Congr.Crop Protect.1957, 1959, 527-30, (G.e.), tabs.3,bibl.6.
In pot trials during 1954-6, studies were made of the breakdown of dalapon and TCA (acid), each at rates of 20, 40 and 80 kg/ha, in a loamy fine sand soil held at 2, 16 or 28°C for 2.5, 5 or 10 weeks. Wheat was used as an indicator plant. At 2°C, there was no appreciable breakdown of either herbicide over a 10-week period. At 16°C dalapon at 20 and 40 kg had disappeared after 10, but not after 5 weeks and the 80 kg rate, both of dalapon and TCA, still showed considerable residual activity after 10 weeks. At 28°C, dalapon at 20 and 40 kg had nearly disappeared after 5 weeks and the 80 kg rate after 10 weeks. With TCA the rate of breakdown at 28°C was less than with dalapon; all rates of application showed considerable residual activity after 5, but none after 10 weeks. In sterilised soil held at 28°C, dalapon and TCA each at 20 kg/ha showed no breakdown after 10 weeks. In trials in 1955, dalapon and TCA at 20, 40, 60 and 80 kg/ha were applied either in May or in September and samples of soil (loamy sand) taken after 2, 4, 6, 10 and 16 weeks, each sample of which was divided horizontally at depths of 0-10, 10-20, 20-30 and 30-40 cm below ground level. Average rainfall in 1955 was only 79 mm during 16 weeks after May and 136 mm during 10 weeks after September. The dalapon applied in May remained for the most part in the uppermost 10 cm soil levels; only the 40 and 80 kg rates penetrated to the 10-20 cm levels. After 10 weeks, only the 80 kg rate left detectable residues and no residues remained after 16 weeks. TCA moved to greater depths than dalapon and was detected in the 20-30 cm levels, and retained considerable activity for all rates of application at the 10-20 cm levels, even after 16 weeks. Following the autumn treatments, dalapon had disappeared from the 0-20 in. levels after 6-10 weeks, but was still active at the 20-40 cm levels. TCA at rates of 40-80 kg was active at all soil depths after 10 weeks, though activity at this stage was greatest in the 20-40 cm levels. In field trials, there was a close relationship between amounts of rainfall and injury to crops sensitive to dalapon and TCA. Aqueous solutions of dalapon and TCA stored in the laboratory for 17 and 5 months, respectively, showed no reduction in phytotoxicity to wheat. - P.J.B. [O.W.]

590. MOREAU, R., JACOB, M. and AUGIER, J. Sur le metabolisme du phenol dans les sols. [On the metabolism of phenol in soils.] C.R.Acad.Sci., 1960, 251,(11),1179-81, bibl.2.
Phenol is broken down more rapidly by microorganisms in forest than in garden soils and more rapidly in the presence of ammoniacal than nitrate nitrogen. - P.J.B. [O.R.]

591. MUNNECKE, D.E. and FERGUSON, J. (Plant Path.Dep.,Univ.California,Los Angeles,U.S.A.) Effect of soil fungicides upon soil-borne plant pathogenic bacteria and soil nitrogen. Plant Dis.Reptr, 1960, 44,(7),552-5, tabs.2, bibl.7.
The results are given of studies to determine the approximate doses of SMDC, methyl bromide and chloropicrin required to kill soil-borne bacterial pathogens under conditions approximating to those in nurseries in California. - P.J.B. [205(79.4)]

592. THOMPSON, A. (Rukuhia Soil Res.Sta., Hamilton,New Zealand). The residual effects of chemicals. Proc.13th N.Z.Weed Control Conf., 1960, 95-101, tabs.7.
Results are given of 6 trials conducted during 2 years to study the effect on seedling numbers of ryegrass [Lolium spp.] and white clover broadcast onto ground treated with dalapon and amitrole at various intervals before sowing. The effect on pasture production of the interval between applying dalapon and amitrole and sowing ryegrass and white clover are reported, together with the results of a trial in which dalapon, amitrole, dalapon + amitrole, dalapon + 2,4,5-TP, and 2,4,5-TP

alone were applied at various intervals before sowing oats, barley, wheat, rye, marrowstem kale, white clover, lucerne and ryegrass. The rates quoted are in # of commercial products, and were applied in 30 gal water/ac.

Dalapon 5 # (85% a.i.) applied on bare ground before broadcasting ryegrass 30 # and clover 8 # gave a 60% kill of ryegrass and 75% kill of clovers sown the same day as spraying, and a 40% kill of ryegrass and a 50% kill of clovers sown 14 days after spraying. Amitrole 2 # (50% a.i.) had little effect on ryegrass and caused severe damage to clovers when applied at up to 14 days before sowing. Where spraying took place on pasture, damage by dalapon to both ryegrass and clover seedlings was limited to about 30% of that caused on bare ground, and amitrole caused no damage except to clover sown on the day of spraying.

Rainfall after spraying reduced the residual effects of the herbicides and this effect was greater on bare ground than on pasture. - P.C. [O.W.]

593. WINTER, B.L. (Borax Consolidated Ltd., Australia). Soil sterilization with special reference to use of borate herbicides. Proc. 2nd Aust.Weeds Conf., 1960, Pap.50, pp.9, tabs.1,bibl.3.

Soil sterilisation under bituminous and similar sealed surfaces is discussed in general terms and some results with borates given. On unsealed soil 2.5-3 lb/ft^2 of Ureabor (monuron 4%, sodium borates 94%) is needed to control Paspalum dilatatum for a year. Chondrilla juncea shows some resistance to Ureabor but has been controlled 99% by Concentrated Borascu (anhydrous borax 94%) 4 lb/100 ft^2, 95% by DB Granular (sodium borate-2,4-D complex) 2 lb/100 ft^2 and 90% by Polybor Chlorate (disodium octaborate 73%, sodium chlorate 25%) 2 lb/100 ft^2; it was observed that the Borascu killed 3-4 year old plants and prevented regeneration from seedlings and that the Polybor Chlorate was excellent for immediate kill especially to prevent seeding and to give a residual effect.

In a trial to prevent emergence of Cynodon dactylon through a thin asphalt coating, herbicides were applied after removing the top growth and rolling, and water was applied subsequently at 2 rates before spraying the asphalt. At the 0.5 in. water rate complete control 1 year later was achieved by Polybor Chlorate 1740 # and by sodium borate-TCA complex (Boron trioxide 53%, TCA 15%) 667 #, and ca. 90% control by Concentrated Borascu 2610 #, sodium chlorate 345 # and TCA 100 #. Results from the 0.1875 in. water rate were less effective except with sodium chlorate. The following herbicides were inferior: Ureabor 870 #, monuron 17.4 #, simazine 17.4 #, 2,3,6-TBA 17.4 # and dalapon 34.8 #.

In 1 trial control of Hypericum perforatum 18 months after application was 99% from Borascu 2 lb/100 ft^2 and 93% from both sodium borate-2,4-D complex 0.5 lb/100 ft^2 and Polybor Chlorate 0.5 lb/100 ft^2. Results with borates on Cardaria draba have not been satisfactory. With Cyperus rotundus results with borates have been good if both the top growth and the surface soil are removed before applying the asphalt; this breaks the dormancy of the deeper nuts and encourages the roots to take up excess boron. Pteridium aquilinum has been found susceptible to Borascu 2-4 lb/10 yd^2 and to sodium borate-2,4-D complex 1-2 lb/10 yd^2. - D.M.L.S. [O.W.]

594. PIECZARKA, S.J. and WARREN, G.F. (Purdue Univ.,Lafayette,Indiana,U.S.A.) Confining fumigants in the soil with surface seals. Weeds, 1961, 9,(1),106-10, tabs.2,bibl.9.

In seedbed trials in cold frames, plots 3 x 6 ft were treated on 24th March (soil temperature 50°F) with SMDC, allyl alcohol and emulsifiable 1,3-dichloropropene at 400 and 800 #, applied in 2 gal water/plot. On 1 set of plots, approximately 15 gal water was applied/plot to act as a water seal and on another set, 4 ml polyethylene film was applied as the other form of seal. The polyethylene film was removed after 5 days. Muskmelon seeds were sown 24 days after treatment and weed counts taken 20 days later. Compared with the water seal, the polyethylene seal greatly reduced the number of weeds/ft^2; at the 400 # rate of fumigant with a polyethene seal, there were less weeds than at the 800 # rate with a water seal. All fumigants gave good weed control when a polyethylene seal was used, though allyl alcohol failed to give good control of grasses. Some treatments reduced muskmelon growth, which may have been due to poor aeration after fumigation. In further trials the following were applied to the surface of soil in pots as seals. Saren Latex F-122A15 and F-122A20 (10 and 52% solids), Dow Latex 512R, 512K and 762W (10% solids), Vinsol Emulsion (10% solids), Polyox WSR 301 (0.125% solution), Plyac concentrate, Goodrite Latex VL-600 concentrate, 1, 1.5 and 4 ml polyethylene films and polyethylene-coated paper. Rates of sealing sprays were 500

and 1000 gal/ac and the fumigant used was 1,3-dichloropropene. Latex VL-600 approached polyethylene film in effectiveness as a seal; other promising materials were Plyac and Vinsol emulsion. The need for an impervious film to confine the fumigant to give effective weed control was evident and for this, thin films of polyethylene were adequate. A technique for screening sealing materials is described. - P.J.B. [O.W.]

595. BAKER, K.F. and OLSEN, C.H. Soil steaming. A review of fundamentals. Calif.Stat.Florists' Ass.Mag., 1959, 8, (9), pp.2.
The various methods (subsurface by perforated pipes or tiles, surface, vault, and the steam rake) are described. - D.M.L.S. [129(74.7)]

596. DORMAL, S. and THOMAS, G. Repertoire toxicologique des pesticides. [Toxicological index of pesticides.] Editions J.Duculot, S.A., Gembloux, Belgium, 1960, Price Fr.Belg.150 (de-luxe edition), Fr.Belge 120 (ordinary edition).
This index has been prepared from data given in a wide range of the international literature on toxicology and is intended for the use of formulators, sellers and users of actively toxic pesticides. It has been prepared in leaflet form to permit amendments and additions and for ready reference and the leaflets are grouped into 16 sections according to the type of pesticide (mineral salts, halogenated fumigants, organo-phosphorus, etc.). Among soil fumigants and herbicides so far included, are methyl bromide, chloropicrin, D-D mixture, PCP, dinoseb, DNOC, 4,6-dinitro-o-cyclohexylphenol, 2,4-dinitrophenol. The principal information given includes: acute and chronic mammalian toxicity and practical information on the toxicity of each chemical to users and to animals and on appropriate therapeutic measures in cases of accident. - P.J.B. [W9(493)]

APPLICATION AND MACHINERY

See also 556.

597. BLACKMAN, G.E. (Dep.Agric., Univ. Oxford, England). Selective toxicity in relation to specific differences in retention, penetration and uptake. Proc.4th internat.Congr.Crop Protect.1957, 1959, 481-7, figs.4, tabs.4, bibl.7.
The results are reviewed of studies on Sinapis alba, Helianthus annuus, Pisum sativum, Linum usitatissimum, Lemna minor, Hordeum vulgare and Salvinia natans. In experiments with growth-regulator herbicides (2,4-D, MCPA, 2,4,5-T) it was established that maximum selectivity between two species was likely to occur where spraying conditions were such as to bring about the greatest differences in retention. Best control of weeds with relatively wettable surfaces in such crops as Hordeum vulgare or Pisum sativum was thought likely to be obtained with a combination of large drop size, a high surface tension, and spray output just sufficient to give complete wetting of the weed leaves. With contact herbicides, the same general conclusions were considered to hold, but the distribution of the spray over the shoot was of relatively greater importance. There appeared to be a clear-cut gradient in reaction to substituted phenoxyacetic acids at cell level and the susceptibility of different species and it was concluded that these differences in susceptibility relate to variations in the degree of interference with the properties of the cytoplasm at the interface with the vacuole. - P.J.B. [O.W.]

598. HUGHES, R.E. and FREED, V.H. (Oregon Agric.Exp.Sta., Corvallis, U.S.A.) The role of surfactants in the foliar absorption of indole-3-acetic acid (IAA). Weeds, 1961, 9, (1), 54-9, tabs.2, bibl.12.
In the experiments reported 30-50 µl of a 1000 p.p.m. solution of IAA (used as the active growth substance) was placed in an area 12 mm in diameter enclosed by a lanolin ring on the primary leaf of bean (Phaseolus vulgaris) plants. In the first experiment 5 different surfactants were added at a rate of 1% to the IAA solution. In all cases, more IAA was absorbed with than without a surfactant. There were considerable differences between surfactants in the extent to which they promoted uptake of IAA and these differences did not appear to be closely related to the surface tension of the solutions. The variability in absorption of IAA caused by differences in environmental conditions was greatly reduced by the addition of surfactants. There was a short period during which absorption of IAA was rapid, followed by a reduction in the rate of absorption up to the 4th to 6th day, after which the rate was much reduced. The absorption of IAA followed a first order rate law. - P.J.B. [O.W.]

599. LEASURE, J.K. (Dow Chem.Co.,Agric. Chem.Res.,Midland,Michigan,U.S.A.) Some techniques and results on quackgrass with C^{14} labelled dalapon with and without wetting agent. Down to Earth, 1961, 16,(4),20-4. See Weed Abstr., 10,169. [O.W.]

600. HOULKER, W.M. (Shell Oil New Zealand, Ltd.,Wellington,New Zealand). Adjuvants as an aid to increasing the efficiency of weed-killers. Proc.13th N.Z.Weed Control Conf., 1960, 52-7.
Theoretical considerations in the coverage, retention and penetration into plant leaves of herbicidal sprays is discussed. In trials to determine the effect of adjuvants on spray coverage, freshly collected shoots of Ulex europaeus and stems of Juncus sp. were immersed in the following: 2,4,5-T ester (a) alone, (b) + spreader (sodium salt of a secondary alkyl sulphate), (c) + spreader-sticker (emulsifiable oil selected for a high degree of tackiness) and (d) water. Coverage of the gorse shoots was relatively high with water also, but was increased by the use of spreader and spreader-sticker. Coverage of Juncus sp. stems was poor with (a),(b) and (d) but was markedly increased by the use of a spreader-sticker. In trials in which segments of gorse were immersed in water or water + spreader-sticker (0.125%), the addition of the latter had little effect on the rate of evaporation of water. Microscopic examination of droplets 0.25 in. in diameter of a mixture of 2,4,5-T 1:3000 + spreader-sticker 0.125% in water from the surface of gorse plants indicated that when all the water had evaporated, the spreader-sticker globules and the 2,4,5-T ester/solvent globules in the droplets suddenly merged together. This effect, it was considered, might account for the resistance to washing-off shown by this formulation and could be expected to enhance the solvent action on plant cuticle.
In 8 field trials, U. europaeus was treated with the following: (a) 2,4,5-T octyl ester 3.6 #, (b) 2,4,5-T octyl ester 3.6 # + spreader-sticker at 0.125% of the spray mixture at high volume and 0.25% of the mixture at low volume. Application was made with high-pressure ground equipment spraying to run-off in 6 trials, and from the air in 2 trials. In 5 out of 8 trials, the use of a spreader-sticker improved control of U. europaeus (in terms of stem death) by 20-50% and also reduced the amount of regrowth from sprayed stems; in no case was control with treatment (b) inferior to (a). - P.J.B. [O.W.]

601. COURSHEE, R.J. (N.I.A.E.,Wrest Park,Silsoe,Beds.,England). Spray drift. Farm'Wkly, 1961, 54,(14),107.
Factors which influence the amount of spray drift and practical measures for reducing drift are reviewed. - P.J.B. [O.W.]

602. ROLLINS, R.Z. (Bur.Chem.,California, Dep.Agric.,California,U.S.A.) Drift of pesticides. Bull.Calif.Dep.Agric., 1960, 49,(1),34-9.
Problems associated with the drift of pesticides (mostly insecticides) applied from the air are reviewed from the standpoint, mainly, of conditions in California. - P.J.B. [208(70.4)]

603. WOOTEN, O.B. and McWHORTER, C.G. (Delta Branch Mississippi Agric.Exp.Sta., Stoneville,U.S.A.). A device for subsurface application of herbicides. Weeds, 1961, 9, (1),36-41, figs.5,tabs.1,bibl.5.
In notes on the performance of the underground applicator, it is observed that it worked well in several loam soils, but scouring was a problem in a heavy clay soil. Bed collapse was not a problem with travel rates up to 5 m.p.h. - P.J.B. [O.W.]

604. McWHORTER, C.G. and WOOTEN, O.B. (Delta Branch Mississippi Agric.Exp.Sta., Stoneville,U.S.A.) The use of fluorescent tracers to study distribution of soil-applied herbicides. Weeds, 1961, 9,(1), 42-9, figs.6 bibl.9.
See Weed Abstr., 10, 177. [O.W.]

605. BALTIN, F. Erfahrungen aus dem Einsatz eines Pflanzenschutzflugzeuges im Ackerbau. [Experiences of the use of plant protection aircraft in farming.] Proc.4th Internat.Congr.Crop Protect.1957, 1959, 1847-50.
Different component factors in the total working time taken in the aerial application of pesticides are listed and their contribution assessed, as is the effect of mean field size, the relationship between mean field size and amount of pesticide applied per ha, and the effect of distance between work place and landing place. - P.J.B. [O.W.]

606. RIPPER, W.E. A new method of control of broadleaved weeds in sugar beet based on a new type of spraying equipment. Proc.4th Internat.Congr.Crop Protect.1957,1959,1823-9. See Weed Abstr., 6,678.

607. GREAT BRITAIN, COMMERCIAL GROWER. Band sprayer for the small holding. Comm.Grower, 1961, (3403), 721, figs. 1.
A three-row hand-propelled band sprayer on bicycle wheels is described. The equipment is used in conjunction with an "Osprey" knapsack sprayer carried on the operator's back and is manufactured by the Dorman Sprayer Co. - H.A. Roberts. [O.W.]

PHYSIOLOGY, MORPHOLOGY AND ANATOMY

608. MAYER, F. (Inst.Pflanzensch., Stuttgart-Hohenheim,W.Germany). Zum Verhalten von Trichloracetat und anderen Halogenacetäten gegen über Sulfhydryl und Aminogruppen sowie einigen sekundären Pflanzenstoffen. [On the behaviour of trichloracetate and other halogenacetates compared with sulphhydryl and amino groups, and also some secondary plant substances.] Biochem.Z., 1957, 328, 433-42, figs.3,tabs.2,bibl.31.
Experimental findings gave no clear indication as to the starting point of the physiological reactions of trichloro-chloro- or iodoacetate. In vitro, chloro-acetate caused a 50% sulphhydryl block in 44 hours, and iodo-acetate in 20 minutes. Chloroacetate started losing the chloro-methyl group immediately in aqueous plant-extracts. Iodo-acetate reacted with the amino-groups of peptone with liberation of iodo-hydric acid, but there was no similar reaction with di- or trichloro-methyl groups. Mixing trichloroacetate with scopoletin or esculin produced a reaction characterised by a yellowish-green discoloration, while chloroacetate had no such reaction. In flax, radish, maize, barley and dandelion [Taraxacum officinale], which take up TCA via the roots, no trichloromethyl compounds were found, but they occurred in tomato and tobacco plants. - P.C. [258(43)]

609. KLINGENSMITH, M.J. (Univ.Michigan, Ann Arbor,U.S.A.) The effect of certain benzazole compounds on plant growth and development. Amer.J.Bot., 1961, 48,(1), 40-5, bibl.22.
The results are given of studies on the effect of a number of benzazole compounds on the growth and development of seedlings and established higher plants and on their interaction with auxin, as measured by polar transport. Compounds tested included: imidazole, 2-mercapto-1-methylimidazole, 4-hydroxy-2-mercapto-6-methyl pyrimidine, benzimidazole, benzotriazole, 2-benzoxazole-thiol, mercaptobenzimidazole, benzothiazole, mercapto-s-methylbenzothiazole, 6-methyl-mercaptopurine, 5-chlorobenzimidazole and 5-chlorotriazole. Cucumber primary root elongation was most actively repressed by mercaptobenzimidazole, followed by benzothiazole; benzimidazole and benzotriazole were about one-tenth as active as benzothiazole. Adenine had no effect on inhibition of cucumber root elongation induced by benzothiazole; it enhanced the effect of benzimidazole and benzotriazole, but had no effect by itself. Benzotriazole applied to the root medium of bean (Phaseolus vulgaris), coleus (Coleus blumeri), tomato, oat and wheat plants caused marked inhibition of internodal elongation and stimulated axillary development. Morphological changes not characteristic of other growth regulators such as the phenoxyacetic acids were induced. Benzimidazole applied to the root medium of plants of several genera resulted in injury to laminar tissues, followed by their desiccation, but had no concomitant effect on the stem. Applications of benzothiazole to the root medium induced the development of adventitious roots in bean and tomato plants and the initiation of roots on tobacco stem segments without suppressing bud development. The respective responses elicited by benzimidazole, benzothiazole and benzotriazole could be clearly distinguished from each other and were dependent on the azole structure of the molecule. There was no evidence that benzazoles were purine anti-metabolites. - P.J.B. [O.W.]

610. BRIAN, P.W., DAWKINS, A.W., GROVE, J.F., HEMMING, H.G., LOWE, D. and NORRIS, G.L.F. (Akers Res.Labs.,I.C.I.Ltd,Welwyn,Herts., England). Phytotoxic compounds produced by Fusarium equiseti. J.exp.Bot., 1961, 12, (34),1-12, figs.1,tabs.5,bibl.12.
Culture filtrates of Fusarium scirpi and F. equiseti were highly phytotoxic. The most important toxic substance isolated was diacetoxyscirpenol ($C_{19}H_{26}O_7$), which was a colourless, crystalline compound, m.p. 161-2°, which hydrolyses with great ease to give scirpentriol. Two other phytotoxic substances, both similar to diacetoxyscirpenol, were also isolated in smaller quantities. Diacetoxyscirpenol at a 10 µg/ml concentration was highly toxic to intact pea plants when sprayed to run-off and caused severe leaf scorch, reduced stem elongation and killed many plants. Similar damage occurred in

lettuce and winter tares [Vicia sp.]. Mustard, wheat, red beet and carrots were unaffected by these concentrations. At concentrations of 0.01-0.5 μg/ml, this substance markedly stimulated elongation of cress roots. This was not an anti-auxin effect. The spectra of activity of the two other substances differed slightly from that of diacetoxyscirpenol. - P.J.B. [O.W.]

611. ABERG, B. (Inst. Plant Physiology, Sweden). Studies on plant growth regulators. 16. The 2- and 3-thianaphthenylacetic acids and the corresponding α-propionic acids. Kungl. Lantbrukshögsk. Ann., 1960, 26, 229-38, figs. 4, tabs. 2, bibl. 15.

When studied with respect to their growth activity on flax roots, wheat roots, and oat coleoptile cylinders, 3-thianaphthenyl acetic acid (3-TnA) was found to be an intermediate growth regulator with a fairly strong auxin component and a weaker anti-auxin component which was revealed only in the oat cylinder test. In the corresponding D-propionic acid [(+) 3-TnP] the anti-auxin component has disappeared and the auxin activity in the oat cylinder test is comparable to that of 3-indolylacetic acid. (-) 3 TnP is similar to 3-TnA but has weaker effects. The 2-thianaphthenyl compounds, which correspond to 2-indolyl and 2-naphthyl compounds, show mainly anti-auxin effects. - Author's Summary (modified). - D.M.L.S. [165(485)]

612. LUCKWILL, L.C. and LLOYD-JONES, C.P. (Long Ashton Res. Sta., Bristol, England). Metabolism of plant growth regulators. I. 2,4-dichlorophenoxyacetic acid in leaves of red and of black currant. Ann. appl. Biol., 1960, 48, (3), 613-25, figs. 5, tabs. 6, bibl. 19.

2,4-D labelled with ^{14}C in either the carboxyl or methylene group was fed through the transpiration stream into detached leaves of black currant, which is sensitive to 2,4-D, and of red currant which is highly resistant. The leaves were then kept in darkness and the evolution of $^{14}CO_2$ was followed; subsequently the leaves were extracted and the metabolic products examined by chromatography and radioassay.

The chief difference between the species is the ability of the red-currant leaf to oxidize approximately 50% of the carboxyl and 20% of the methylene carbon from the side chain of the 2,4-D over a period of 1 week; in the black currant leaf only about 2% of the 2,4-D is broken down in this way in the same period. The red currant leaf can metabolize in a similar manner the side chains of 2,4,5-T, 4-CPA and MCPA but not of 2-chlorophenoxyacetic acid (2-CPA).

In both species 5-10% of the 2,4-D taken up by the leaves is converted to water-soluble compounds which are biologically inactive in the oat mesocotyl and Coleus abscission tests and which yield 2,4-D on hydrolysis with 2N sulphuric acid. The failure of 2-CPA to produce growth responses in currants, and probably in other plants, is attributable to the conversion of 70-80% of the applied chemical to water-soluble inactive compounds. A further 5-10% of the 2,4-D entering the leaf is metabolized to a biologically active, non-acidic neutral compound. Analagous compounds were formed in leaves treated with 2,4,5-T or 2-CPA.

In both species a variable proportion (10-30%) of 2,4-D, 2,4,5-T and 2-CPA are bound in the leaf tissue and cannot be removed by aqueous or organic solvents or by mild hydrolysis.

The red currant is killed by low concentrations of 2,4,5-T even though this compound is broken down in the leaf as rapidly as 2,4-D; death is delayed and there are no epinastic reactions. - From Authors' Summary. - D.M.L.S. [O.W.]

613. LUCKWILL, L.C. and LLOYD-JONES, C.P. (Long Ashton Res. Sta., Bristol, England). Metabolism of plant growth regulators. II. Decarboxylation of 2,4-dichlorophenoxyacetic acid in leaves of apple and strawberry. Ann. appl. Biol., 1960, 48, (3), 626-36.

Comparison of the metabolism of ^{14}C carboxyl-labelled 2,4-D in detached leaves of different varieties of apple showed that the 2,4-D-resistant Cox decarboxylated 57% of the 2,4-D in the leaf in 92 hours, whereas the susceptible Bramley's Seedling decarboxylated only 2% in the same time. Comparatively high rates of decarboxylation were found with all 10 apple varieties related to Cox tested, whereas 13 varieties unrelated showed low rates. Similar high rates of decarboxylation were found in resistant strawberry varieties, Royal Sovereign and Cambridge Favourite, whereas the susceptible Huxley showed a much lower rate. Of 17 other species tested Syringa vulgaris, which is resistant, showed a high decarboxylation rate, and the 16 other species low rates irrespective of whether they were resistant or not.

The rate of decarboxylation of 2,4-D in the mature strawberry leaf was propor-

tional to the amount of 2,4-D in the leaf. The rapid fall in decarboxylation rate in a detached leaf was due chiefly to reduction in the amount of 2,4-D present and not to any falling off in the metabolic activity of the leaf. Young leaves decarboxylated 2,4-D at about half the rate of fully grown or senescent leaves. Oxidation of the methylene carbon proceeds at less than half the rate of that of the carboxyl carbon and is accompanied by an increase in the phenol content of the leaf which agrees closely with the amount of 2,4-D demethylated.

As previously reported for currants, part of the 2,4-D entering the leaf was bound and part inactivated by the formation of water-soluble compounds. The reaction of strawberry variety Talisman to 2,4,5-T, 2-CPA, 4-CPA and MCPA was similar to that of red currant. Leaves of Cox's Orange Pippin apple and Talisman strawberry were able to decarboxylate all these phenoxy acids except 2-CPA.

The results indicate that in apples and strawberries, as in currants, (but not in all species) resistance to 2,4-D is closely associated with high rates of decarboxylation.

A mechanism for the detoxication of 2,4-dichlorophenol (which is thought to be the end product of the reaction) is also necessary to confer resistance to 2,4-D and it was shown that apples, strawberries and currants all possess such a mechanism. D.M.L.S. [O.W.]

614. PENOT, M. (Inst.Bot.,Strasburg, France). Deplacements de l'aminotriazole et du radiophosphore lies aux mouvements glucioliques. [Translocation of amino triazole and radioactive phosphorus in association with movements of carbohydrates.] C.R.Acad.Sci.Paris, 1960, 251,(22),2578-80, (F.f.)

Branches of Tradescantia viridis were (a) kept in darkness for 48 hours before amitrole application and until the end of the experiment, (b) kept in darkness for 48 hours before and for 24 hours after amitrole application, and (c) kept in darkness and injected with sucrose simultaneously with amitrole application. The results showed that when applied to the leaf, movement of amitrole in the phloem will only take place in the presence of carbohydrates, whereas movement of radioactive phosphorous, although facilitated by the movement of carbohydrates, can take place independently of it. D.M.L.S. [O.R.]

615. FANG, S.C. and THEISEN, P. (Dep.Agric. Chem.,State Coll.,Corvallis,Oregon,U.S.A.) Uptake of radioactive ethyl-N,N-di-n-propyl thiocarbamate (EPTC-S^{35}) and translocation of sulfur-35 in various crops. J.agric.Fd Chem., 1960, 8,(4),295-8, figs.1,tabs.2, bibl.2.

A study of the absorption of radioactive EPTC by crops following pre-em. application indicated an uptake of this chemical from soil. Using radioautographic techniques, differences in accumulation patterns of ^{35}S from EPTC-^{35}S among crops were demonstrated; above-ground portions of beans, peas and corn contained slightly more ^{35}S than the roots, while above-ground portions of radishes, carrots, cabbage, mustard, swiss chard, red beets, cucumber and mung bean contained 70 to 94% of the ^{35}S from the absorbed EPTC-^{35}S. Total absorption by individual crops at various stages of growth was determined. Generally, an increase in applied EPTC-^{35}S increased absorption, but not in proportion to the increase in rate of application. - Authors' Summary. [O.W.]

616. HEATH, O.V.S. and CLARK, J.E. (Plant Physiol.Res.Inst.,Imperial Coll.,London, England). Chelation in auxin action. 1. A study of the interactions of 3-indolylacetic acid and synthetic chelating agents as affecting the growth of wheat roots and coleoptile sections. J.exp.Bot., 1960, 11,(32), 167-87, figs.10,tabs.1,bibl.29.

Evidence is adduced to support the hypothesis that IAA acts as a chelating or complexing agent in its effects on the growth of wheat roots and coleoptile sections. A mutual interaction between IAA and a single known, or two known chelating agents was demonstrated, in which the growth inhibiting effect of either agent alone was almost completely removed by the presence of one-millionth the concentration of the other. The objections to this hypothesis are discussed and possible ways in which IAA or other growth substances may regulate plant growth by chelation are considered. - P.J.B. [O.W.]

617. LOTLIKAR, P.D. (Oregon State Coll., Oregon,U.S.A.) Effects of herbicides on oxidative phosphorylation in mitochondria from cabbage, Brassica oleracea. Ph.D. Thesis Oregon State Coll., 1960, pp.108. Microfilm $2.50, Xerox $5.40.

Twenty-two herbicides, including 2,4-D 2,4-DB, propham NPA, amitrole, MH and sodium chlorate, were tested for their effects on oxidative phosphorylation in cabbage mitochondria. - Diss.Abstr., 21,(3),446-7.

618. LEITT, G.W. (Dep.Biol.Sci., Florida State Univ., Tallahassee, U.S.A.) Effects on certain growth substances on elongation and geotropic curvature of wheat roots. Bot. Gaz., 1960, 122, (1), 51-62, figs.17, tabs.1, bibl.27.

A study was made of the quantitative relation between elongation and positive geotropic curvature of wheat seedling roots in response to different concentrations of 8 growth-regulating compounds. Optimum positive geotropic curvature responses were obtained at 14°C and a pH of 7.0. The following 3 types of geotropic response were distinguished: (a) inhibition of elongation and curvature of roots in response to indole-acetic acid, naphthaleneacetic acid, 2,4-D, 2,3,6-TBA and N-[2,4-dichlorophenyl] maleimide; (b) relatively greater inhibition of curvature than elongation in response to 2,3,5-triiodobenzoic acid, N-1-naphthylphthalamic acid and 2,3,6-TBA during the first 12 hours after application; and (c) relatively greater inhibition of elongation than curvature in response to propham. The separation of growth and curvature response in terms of differential susceptibility to chemical inhibition suggests that the mechanisms for receiving and for responding to stimuli are separate. - P.C. [O.W.]

619. KIERMAYER, O. (Osterreichische Stickstoffwerke A.G., Linz-Donau, Austria). Zur Klassifizierung der Giberellinsäure als Wuchstoff. [On the classification of gibberellic acid as a growth regulator.] Ber.dtsch.bot.Ges., 1959, 52, pp.1, bibl.3.

Tests were carried out to explain the activity of gibberellic acid in damaged coleoptiles, using intact Avena coleoptiles as test plants. The activity of gibberellic acid was closely related to light-induced growth processes, and it appeared that the inactivity of gibberellic acid in intact coleoptiles was due to their etiolation. It was concluded that gibberellic acid depends on a growth factor other than the usual auxins, and so cannot be correctly described as a growth regulator in the ordinary sense. - P.C. [55(436)]

PATENTS

620. HEYWOOD, B.J. and LEEDS, W.G. (May & Baker Ltd., Essex, England). Aryloxyaliphatic compounds. British Patent 1956, 827 372.

Compounds 4,6,3,1-Cl.C_6H_2XY.O.R.OH and herbicidal compounds containing them are claimed. X = Cl and Y = H or Cl, or X = Me or H and Y = H, R = hydrocarbon chain of 4 C, optionally substituted by Me on the C adjacent to the phenoxy radical and optionally containing a double band. In an example, the preparation of 4-(4'-chloro-2'-methylphenoxy)butyl bromide is detailed. - From J.Sci.Fd Agric., 1961, 12, (3), i-131. - P.J.B.

621. UNITED STATES VELSICOL CHEMICAL CORPORATION. Substituted halogenated bicycloheptenes. British Patent, 1958, 827 435.

Treatment of 1,2,3,4,7,7-hexachlorobicyclo (2,2,1) hepta-2,5-diene with O_2 at 75-150°/1-200 p.s.i. in the presence of Cl_2 as a catalyst gives, among other compounds, 1,2,3,4,7,7-hexachloro-6-hydroxy-5-oxobicyclo (2,2,1) hept-2-ene and 3,4,5,6,8,8-hexachloro-3,6-methano-2-oxo-1-oxacyclohept-4-one, useful as herbicides and insecticides. - From J.Sci.Fd Agric., 1961, 12, (3), i-131. - P.J.B. [O.W.]

622. HACKMANN, J.T. and TEN HAKEN, P. Herbicidal compositions. British Patent 1957, 828 877.

Compositions for use in the control of plant growth comprise a liquid or solid carrier, a surface-active agent and (as a herbicide) a compound of Y.CO_2.CHClR (also claimed). Y = O.CHCl.R, OR' or NR''R''', R = hydrocarbon radical of 1-4 C or pH optionally substituted by a halogen, R' = hydrocarbon radical of 1-8 C, R'' and R''' = H, aliphatic group of 1-4 C or, together with N, comprise a heterocyclic radical. Compounds specifically claimed include 1,2,2,2-tetrachloroethyl allylcarbamate and diallylcarbamate. - From J.Sci.Fd Agric., 1961, 12, (3), i-131. - P.J.B. [O.W.]

MISCELLANEOUS

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The problem of weed control in Germany is analysed and evaluated in relation to climate, geography, geology and land tenure, and a few of the principal weeds are listed in order of economic importance. - P.C. [O.W.]

625. KRAMER, K. Zur Anwendung von Herbiziden auf Kulturland. [On the utilization of herbicides on cultivated land.] Gesunde Pflanzen, 1960, 12,(9),pp.4, (G.).
The practical uses of different herbicides in common use are reviewed briefly. - P.J.B. [277(43)]

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627. WILLS, G.J. (Ivon Watkins Ltd., Dunedin, New Zealand). New aspects of vegetation control. Proc. 13th N.Z.Weed Control Conf., 1960, 62-65.
A review of current practices in chemical weed control in ditches, roadsides and railway banks. - P.C. [O.W.]

628. BURNSIDE, O.C., FURRER, J.D., McCARTY, M.K. and BOVEY, R.W. Chemicals that control weeds - a guide for 1960. Ext.Circ.Univ.Nebraska Coll.Agric., (n.d.), 60-130, pp.4.
Gives condensed recommendations for practical weed control in field and herbage crops, non-crop land, for controlling a number of important Nebraska weeds and weeds of turf, and for the use of preharvest desiccants. - P.J.B. [16(78.2)]

629. VEATCH, C., SCHUBERT, O.E. and CARVELL, K.L. Weed control - 1960 suggestions. Circ.W.Virginia agric.Exp.Sta., 1960, 108, pp.19.
Gives recommendations for the control of a number of important weeds and for weed control in field, herbage crops, vegetable and fruit crops, in turf, and for the control of woody species. - P.J.B. [10(75.4)]

630. UNITED STATES, ARIZONA AGRICULTURAL EXPERIMENT STATION. Chemical weed control recommendations for irrigated areas of Arizona, 1961. Bull.Univ.Arizona Coop. Ext.Serv. & agric.Exp.Sta., 1960, pp.11. [21(79.1)]

631. GREAT BRITAIN, MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. At the farmer's service. Min.Agric.Fish.Fd Booklet, 1960, pp.81.
p.35. Scrub clearance grants. Give details and conditions of grants for the prevention, by scrub clearance or fencing, of damage by rabbits. - D.M.L.S. [450(42)]

632. GERMANY. (Biol.Bundesanstalt für Land- und Forstwirtschaft, Braunschweig, W.Germany). Jahresberichte der Pflanzenschutzämter. [Annual reports of plant protection bureaux.] Ann.Rep.German Plant Protection Service, 1958, pp.252.
Details are given of current work on plant protection, including weed control, at the various West German State Agricultural and Forestry Institutes. - P.C. [O.W.]

List of Common Names and Chemical Abbreviations

The following list, based on that adopted by the Weed Society of America, has been approved by the British Weed Control Council, except for those marked □.
An asterisk (*) signifies common names approved by the B.S.I.
A plus sign (+) signifies approval by the Weed Society of America.

amiben □+	3-amino-2,5-dichlorobenzoic acid
amitrole □+	3-amino-1,2,4-triazole
AMS □+	ammonium sulphamate
atrazine □+	2-chloro-4-isopropylamino-6-ethylamino-1,3,5-triazine
barban □	4-chloro-2-butynyl-N-(3-chlorophenyl)carbamate
CDAA +	2-chloro-NN-diallylacetamide
CDEA +	2-chloro-NN-diethylacetamide
CDEC +	2-chloroallyl-NN-diethyldithiocarbamate
chlorpropham *	isopropyl-N-(3-chlorophenyl)carbamate
4-CPA +	4-chlorophenoxyacetic acid
4-CPB	4-(4-chlorophenoxy)butyric acid
2,4-D +*	2,4-dichlorophenoxyacetic acid
3,4-DA +	3,4-dichlorophenoxyacetic acid
dalapon +*	2,2-dichloropropionic acid
2,4-DB *	4-(2,4-dichlorophenoxy)butyric acid
DCU □+	dichloralurea
2,4-DEB +	2,4-dichlorophenoxyethyl benzoate
2,4-DES *	2,4-dichlorophenoxyethyl hydrogen sulphate
dichlone +*	2,3-dichloro-1,4-naphthoquinone
dinosam *	2-s-amyl-4,6-dinitrophenol
dinoseb *	2-s-butyl-4,6-dinitrophenol
diquat +*	1,1'-ethylene-2,2'-dipyridylium dibromide
diuron +*	N-(3,4-dichlorophenyl)-N'N'-dimethylurea
DMTT □+	3,5-dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione
DNOC *	2-methyl-4,6-dinitrophenol or 3,5-dinitro-o-cresol
2,4-DP	2-(2,4-dichlorophenoxy)propionic acid
endothal +	3,6-endoxohexahydrophthalic acid
EPTC □+	ethyl-NN-dipropylthiolcarbamate
erbon +	2-(2,4,5-trichlorophenoxy)ethyl-2',2'-dichloropropionate
fenac □+	2,3,6-trichlorophenylacetic acid
fenuron +*	N-phenyl-N'N'-dimethylurea
ipazine □+	2-chloro-4-diethylamino-6-isopropylamino-1,3,5-triazine
MCPA +*	4-chloro-2-methylphenoxyacetic acid
MCPB *	4-(4-chloro-2-methylphenoxy)butyric acid
MCPES +	sodium 4-chloro-2-methylphenoxyethyl sulphate
mecoprop *	dl-2-(4-chloro-2-methylphenoxy)propionic acid
MH □+	maleic hydrazide
monuron +*	N-(4-chlorophenyl)-N'N'-dimethylurea
neburon +	N-(3,4-dichlorophenyl)-N'-butyl-N'-methylurea
NPA +	N-1-naphthylphthalamic acid
PCP +	pentachlorophenol
PMA +	phenylmercuric acetate
propazine □+	2-chloro-4,6-bis(isopropylamino)-1,3,5-triazine
propham *	isopropyl-N-phenylcarbamate
simazine +*	2-chloro-4,6-bis(ethylamino)-1,3,5-triazine
SMDC □+	sodium methyl dithiocarbamate
2,4,5-T +*	2,4,5-trichlorophenoxyacetic acid
2,4,5-TB	4-(2,4,5-trichlorophenoxy)butyric acid
2,3,6-TBA +	2,3,6-trichlorobenzoic acid
TCA +	trichloroacetic acid
2,4,5-TES +	sodium 2,4,5-trichlorophenoxyethyl sulphate
2,4,5-TP	2-(2,4,5-trichlorophenoxy)propionic acid
trietazine □+	2-chloro 4-diethylamino-6-ethylamino-1,3,5-triazine
3Y9 □	tris-(2,4-dichlorophenoxyethyl)phosphite

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